Home furnishing start-up venture

Michael A. Koranda

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HOME FURNISHING
START-UP VENTURE

by
Michael A. Koranda

An Applied Management
Decision Report
Submitted in Partial Fulfillment
of the Degree Requirements for the Degree of
Master of Business Administration
Cardinal Stritch College
September 24, 1991
This committee has approved the Applied Management Decision Project by Michael A. Koranda

Mary Beth Plane, Ph.D, Case Study Advisor

Gary Keller, M.S., Second Reader

Raymond A, Schultz, Ph.D, PI MTA Representative
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ACKNOWLEDGEMENT

This report is the culmination of ten years of effort in maintaining career goals and achieving an advanced degree.

A special thanks goes to my wife and family who have greatly assisted and at times endured through this. Next is a thanks to the Instructors and Colleges that provided the time, talent, expertise, professionalism, and resources that made continuing education possible. Training and educating is a gift often overlooked. Last but not least are the people that assisted in making this report, the typing and proofreading that require special skills.

This report is a result of a team effort and hard work.
Executive Summary

The AMDR represents my clients, a couple that is near retirement age. The couple has been active at making various craft items on a small scale for area craft shows. They have selected one item, wind chimes, for production on a slightly larger scale. The chimes have been one of their most popular items.

The making and selling of chimes will be looked upon as a means to keep busy after retirement and provide additional retirement income.

The couple, prior to this decision, had a good idea on Dane County or Madison area make up. What they lacked was basic area statistics, market research information, user characteristics, costs of production, methods of production, and capital requirement needs.

The AMDR supplies them with this information and uses quantitative facts to augment and supplement their intuitive and qualitative ideas about the area. A customer survey card, supplied with the chimes, if returned, will provide valuable information to support the assumptions advanced in this report.
The couple has elected to retire on August 2, 1991, which will allow them to proceed with the plans set out. It will also allow for sales during the last Fall holidays and some production of chimes before next Spring.
Section 1

Introduction

As a newly formed company, Home Furnishings will be a family owned venture located within the home of a couple near retirement age. The couple has been making chimes and other items on a smaller scale for various craft shows. They want to know the implications of production on a slightly larger scale. The couple also wants to remain active and enjoy their leisure time and supplement their retirement income. Table 1.1 illustrates the amount needed each month.

INCOME ANALYSIS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Monthly Income</td>
<td>$4,417.00</td>
</tr>
<tr>
<td>Income Expected From Retirement</td>
<td></td>
</tr>
<tr>
<td>Estimated Monthly Social Security Income</td>
<td>$1,119.00</td>
</tr>
<tr>
<td>Company Pension Benefits</td>
<td></td>
</tr>
<tr>
<td>Estimated Options $1,500 to $1,900</td>
<td>$1,700.00</td>
</tr>
<tr>
<td>Other Savings (Retirement Plans) Estimated</td>
<td>$900.00</td>
</tr>
<tr>
<td>Amount of Current Income Gain (Loss) Due to Retirement</td>
<td>($698.00)</td>
</tr>
</tbody>
</table>

Table 1.1
They currently enjoy making various home furnishings or accessory items. The couple further feels due to their number of years of experience in making craft items and a readily accessible source of supplies, this venture will be successful.

The couple has visited furniture outlet retailers, gift store owners, hardware stores, and other various retail discount stores in the Madison area. Development of their products will have to include a consumer want and need for the various accessory items. From their success at craft shows, the couple has concluded that wants and needs do exist for various accessory items and in particular, wind chimes. To fill this void, they want to build a durable, attractive wind chime to start up their company. The couple over the past 3½ years have made approximately 350 wind chimes. At the craft shows they have been to, they have sold all of the chimes they have produced and have only had to reduce the price of the chimes twice. This reduction was done because of shortened shows due to inclimate weather. The couple has never had a quality complaint about their chimes.

The market research process was begun by reviewing various trade journals and visiting retail shops. During this review, the couple concluded from talking to various store owners and their banker that:
1. Tight money supply and current employment trends for the market indicate that consumers are investing more income in making their present surroundings more pleasant rather than trying to relocate.

2. Consumers are investing more in less expensive accessory items.

3. Consumers want more quality goods and are willing to spend slightly more for them, but restrict their buying to fewer goods.

4. Consumers are more energy conscious and are purchasing items that require less energy or are non-energy using.

5. Consumers prefer more color and brightness and seem to gravitate towards the handcrafted look, placed in natural, less formal surroundings.

These points in my estimation are all valid. The items reflect a perception the couple and I believe the populace in general hold true. We are in the midst of an economic recession and if the consumer is willing to pay more for an item, they expect better quality. Consumers are more energy conscious. This is very evident from the uses of energy efficient cars, to lights, to increased use of bicycles, more use of mass transit, and energy efficient home heating...
and air conditioning systems. The couple has a granddaughter that is a home decorator and she has led them to believe that item number five is correct. If you look at parade homes and handcrafted shops in the various area malls you also get an impression that this is correct.

During conceptualization of this product, the couple made and tested replicas of the chimes, listed in Table 3.1, and have sold them in craft shows and have given them to various family members. They were very pleased with the way the chimes held up, looked and sounded. A majority of the family members live in Wisconsin or in adjacent states. The chimes that have been given to family members have represented all models contained in this text. Any problems in workmanship, quality, or durability were looked at based on the family members comments and taking into account who they come from. Some family members are more credible then others. There were no major changes. This information along with their previous sales experience has led the couple to believe they have a good product. Product design and durability were the primary concerns of these tests. The basic design provides for a durable product that also must be competitively priced and deemed a "good" value. Essentially the product will be economical and durable.
With this basic information the writer was contacted to further evaluate the market, review production methods and costs, and provide for possible solutions. The AMDR will include a breakdown of:

1. The couples' current income vs. supplemental income and retirement (pension) income.
2. Market research data.
3. User profile.
4. Potential market demand.
5. Marketing strategy.
6. Product start-up needs.
7. Capital needs.
8. Manufacturing, packaging, and distribution methods.
9. Cost of production.

When the data has been accumulated and analyzed, sufficient information will then be available to determine:

1. If entry into the market can be obtained.
2. If there are any significant barriers to entry.
3. If production of wind chimes will meet income and capital requirements.
When these three questions have been answered, then one of two possible decisions supported by the marketing area research can be undertaken:

1. Not to produce the item.
2. Proceed with production of the wind chimes, assuming margins support the product.

There could be many additional decisions here. But there will be no additional decisions until data has been received after:

1. Production has started assuming they start production based upon a decision to implement;
2. Actual data (variances) from the cost of production is analyzed;
3. Variances are translated into profit picture for the couple;
4. Data from the field supports the business propositions contained in the start up via survey cards.

The couple is learning to take data and determine whether it supports their assumptions.

There are a lot of what ifs, and these what ifs need to be supported. In any new start up or venture, there is always some uncertainty. To erase some uncertainty they need actual data to arrive at decisions that are data
driven. The intent of the proposition is not to create more what ifs but is to take already learned knowledge from the couples experiences and to provide a means for them to gain more knowledge and hopefully apply some business basics to make them more successful.
Section 2

User Profile

The first step in determining market characteristics is to develop a user information format. Although subjective in nature, this format shows demographic and individual disposition characteristics that can be charted against usage intensity of potential customers. A customer profile will then develop. This is detailed in the form of a "User" information table. (Engle, 1975) (Tables 2.1 and 2.2)

With the couples' knowledge from various trade shows we sat down and completed the Tables to the best of their knowledge. After completing Table 2.1 and 2.2, a consumer profile is developed that shows buyers are likely to purchase chimes are:

1. Ages 50 and up.
2. Female.
3. Family income of $45,000 and higher.
4. Currently employed or retired.
5. Middle to upper income.

Based on analysis of potential user characteristics, to sell the product to this group you will most likely tend to:

1. Provide awareness.
2. Provide some reference as to price and place the chime can be purchased.
3. Create a need.
4. Find what advertising exposure will most likely reach this group.
5. Find what advertising will motivate consumers' to purchase.
6. Predict a purchasing behavior.

This profile, along with the Madison area statistics, will aid in determining the number of household units that can be considered as marketable.
<table>
<thead>
<tr>
<th>Necessary Information</th>
<th>Non-Users of Product</th>
<th>Light-Moderate Users of Product</th>
<th>Heavy-Users of Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0-25</td>
<td>25-50</td>
<td>50-up</td>
</tr>
<tr>
<td></td>
<td>45% of population</td>
<td>29% of population</td>
<td>26% of population</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td></td>
<td>48.2% of population</td>
<td>51.8% of population</td>
</tr>
<tr>
<td>Family Income</td>
<td>$0 - $15,000</td>
<td>$15,000 - $45,000</td>
<td>$45,000 and up</td>
</tr>
<tr>
<td>Employment</td>
<td>Unemployed</td>
<td>Employed and Retired</td>
<td>Employed and Retired</td>
</tr>
<tr>
<td>Economic Class</td>
<td>Lower</td>
<td>Lower, Middle and Upper</td>
<td>Middle and Upper</td>
</tr>
</tbody>
</table>

Table 2.1
## Analysis Procedure for the Madison Area

<table>
<thead>
<tr>
<th>Necessary Information</th>
<th>Non-Users of Product</th>
<th>Light-Moderate Users of Product</th>
<th>Heavy-Users of Product</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual Dispositions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>Not Aware</td>
<td>High Awareness</td>
<td>Medium Awareness</td>
</tr>
<tr>
<td><strong>Evaluative Criteria</strong></td>
<td>Reference</td>
<td>Reference, Observation and Product Info.</td>
<td>Reference, Observation</td>
</tr>
<tr>
<td>Attitude Toward Product</td>
<td>Frivolous</td>
<td>Created Need</td>
<td>Created Need</td>
</tr>
<tr>
<td>Media Exposure</td>
<td>Radio, TV, Newspaper</td>
<td>Radio, TV, Newspaper, Periodicals</td>
<td>Radio, TV, Newspaper, Periodicals</td>
</tr>
<tr>
<td>Psychographic Characteristics</td>
<td>Not important</td>
<td>Indifferent to Important After Need Created</td>
<td>Indifferent</td>
</tr>
<tr>
<td>Social Influence</td>
<td>Low</td>
<td>Low to High</td>
<td>Indifferent</td>
</tr>
<tr>
<td>Purchase Patterns</td>
<td>Need Oriented Shop for Others on Demand</td>
<td>Impulsive, Planned and Sale Shopping</td>
<td>Impulsive Sale Shopping and Planned</td>
</tr>
</tbody>
</table>

Table 2.2
Madison Area Statistics

The Standard Metropolitan Statistical Area (SMSA) shows one city of 175,000 and a contiguous urban area of 378,000. (SMSA. Census of Population, 1980) The SMSA includes the City of Madison and Dane County. The couple's main market thrust will be geared to females of the ages 20-30 and 50 and over (See Figure 2.1) (SMSA. County Business Patterns Wisconsin, p. 60). This will give the owners a main market of 85,000 people. This is supported by the information gained in Table 2.1. When combined with the second and third market areas, those females of 40-50 years of age and 30-40 years of age, the couple has a potential total market of 143,000 people (Figure 2.1). The SMSA is ranked 101 in population nationally (SMSA. Census of Population) (Table 2.3) (Sales and Marketing Management, 1989). The Buying Power Index (BPI) is .1627 or 111th for all SMSA's nationally (Sales and Marketing Management, 1989). The BPI is a weighted index that converts three basic elements - population, effective buying income, and retail sales - into a measurement of the market's ability to buy. The BPI is most useful in estimating the potential for mass product sold at popular prices. The Madison Area has a BPI of .1627. Any BPI above .15 is very favorable.
Effective Buying Income (EBI) is personal income less personal tax and non-tax payments such as fees, penalties, fines, etc. EBI is a bulk measurement of market potential. It indicates the general ability to buy. The area total EBI is in excess of 4.7 billion dollars and is ranked 113th (Table 2.3) (Sales and Marketing Management, 1989). This is very promising.
### MARKET SEGMENTS

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Group</th>
<th>Population</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Males</td>
<td></td>
<td>182,196</td>
<td>48.2</td>
</tr>
<tr>
<td>Females</td>
<td>20 - 30</td>
<td>44,982</td>
<td>11.9</td>
</tr>
<tr>
<td>Under 20</td>
<td></td>
<td>55,944</td>
<td>14.8</td>
</tr>
<tr>
<td>Females</td>
<td>30 - 40</td>
<td>26,838</td>
<td>7.1</td>
</tr>
<tr>
<td>50 and over</td>
<td></td>
<td>40,446</td>
<td>10.7</td>
</tr>
<tr>
<td>Females</td>
<td>40 - 50</td>
<td>23,058</td>
<td>6.1</td>
</tr>
</tbody>
</table>

**Figure 2.1**

Total population area 378,000.
50% of Marketing aimed at 113,400.
### Statistical Information Pertinent Market Variables

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madison area population</td>
<td>378,000</td>
</tr>
<tr>
<td>Median age of population</td>
<td>30.1 years old</td>
</tr>
<tr>
<td>Number of households</td>
<td>141,600</td>
</tr>
<tr>
<td>Effective Buying Income</td>
<td>$4,722,595; Rank 113th</td>
</tr>
<tr>
<td>Mean Family EBI</td>
<td>$40,500</td>
</tr>
<tr>
<td>Median Family EBI</td>
<td>$25,812</td>
</tr>
<tr>
<td>% of population by age groups</td>
<td></td>
</tr>
<tr>
<td>0-25</td>
<td>38.5%</td>
</tr>
<tr>
<td>25-50</td>
<td>41.6%</td>
</tr>
<tr>
<td>50-over</td>
<td>19.9%</td>
</tr>
<tr>
<td>Market Rank in Wisconsin:</td>
<td>2nd</td>
</tr>
<tr>
<td>Market Rank in U.S.</td>
<td>101st</td>
</tr>
</tbody>
</table>

Table 2.3
Potential User Characteristics

The BPI and EBI data shows that the Madison market area or group tends to overspend and has a higher than average income level due to a stable commercial and industrial base. In general merchandise sales, the Madison Area is ranked 86th, with a total of 384.5 million dollars (Sales and Marketing Management, 1989). The general merchandise sales data directly correlates with the strong showing of BPI and EPI data. This indicates that the potential users groups identified in Section 2 will most likely have the ability to buy an item such as the wind chime.

Product/Marketing Mix

Now that the target market has been selected, the couple can turn its attention to the production of chimes and its marketing mix. Since chimes are ordinarily hung outdoors, the set built from the attached design (see Appendix 1) and built from the various materials in Table 3.1 can indeed withstand extreme weather conditions. They are able to meet what the consumers require in a product; that is, it is low priced and a perceived good value, while being both economical and durable.
In building the chimes, various supply sources were examined. The couple has two close suppliers, which are hardware stores, to choose from, and both are a short distance from their home. Material costs will be developed later (Table 3.1).

The overhead costs are negligible since all buildings, taxes, utilities, and tools are fixed costs already covered by the family's living requirements. This also will be developed later.

The couple wants to realize at least a 25% return on investment, half of which will come from their savings, which yields 8-12% interest and the other half through a local bank, which would commit funding at an approximate 12% rate.

The couple at this point has no known local manufacturing competition. Market substitutes are readily available. The market price can possibly be influenced by the available substitutes and competitor reaction to the introduction. Some hardware stores, gift shops, and one specialty shop now carry chimes at a retail value of $15 to $45, with a total store markup of 100% over cost. With this in mind, a starting point for pricing should use a 50% markup over cost in order to allow retailers to add their markup and still be below the competition and fall within
the above range. The initial price will be set far enough below the competition to generate an initial demand and not be beyond production capability. The pricing will need to be developed also with the following points in mind.

1. Some profit expected during the first year or introduction year.

2. The price can be increased on a gradual basis until it reaches what the market can bear or until a reasonable profit is realized.

Potential market demand is developed in Figure 2.5.

The numbers in Figure 2.5 are derived from standard formulas taken from the book Promotional Strategy, Engles, 1975 and Data from the SMSA. This information, when combined with the information contained in Tables 2.1 and 2.2 and Figure 2.1, gives you an estimated number of potential buyers in a given market area.
Potential Market Quantities

Quantity required to satisfy market potential for heavy user column:

1. Estimated 50% of potential users, or 1/2, would purchase (Figure 2.1 - Females 20 - 30 and 50+), or .5 X 22.6% = 11.3%.

2. 11.3% of total population X total population in households = .113 x 378,000 = 21,357 units required for heavy users.

Quantity required to satisfy market potential for light-moderate user column:

1. Estimated 50% of potential users or .5 X 13.2% (Figure 2.1 - Females 30-40 and 40-50 of total population).

2. 6.6% of total population X total population in households = .066 X 378,500 = 8,327 units required for light-moderate users.

21,357 - heavy users
8,327 - light-moderate users
29,684* - units required to meet likely market potential for high user categories only.

* 29,684 units represents the total amount of purchases the area would support. The only time this would be changed is if the area demographics severely changed or sales proliferation of the item occurred forcing a relook at the number of units sold by competitors.

\[
\text{Units required} = \frac{29,684}{378,000} = .079
\]

Potential market is 7.9% of total population in the Madison area market.

Figure 2.5
Promotion

The couple can direct its sales through mail orders, area flower shops, gift and specialty shops, outdoor furniture stores, flea markets, hobby shops, and outdoor exhibits. They will gear up for pre-holiday sales, especially Memorial Day and Christmas. The primary target areas for the outlets mentioned will be concentrated in residential areas, areas with multiple dwelling complexes having balconies, and college population areas.

The promotional program at the retailers could include visual displays with a finished product. Kits could also be sold in hobby shops. The couple's primary source of sales has been at craft shows and fairs. The couple can set up their displays and show chimes being produced on the spot. Mail orders could also be procured through area magazines, shopper guides, and newspapers. Costs for a 2-1/2" X 2" color display advertisement in Journal is $207.00 a day. Black and white advertising is $35.00 - $45.00 per week in the Journal. Advertisements in the Madison Area Shopper would be $25.00 - $40.00. Also, many area communities have their own forms of local shoppers, such as the Sun Prairie Advertiser and this local advertisement could be used, particularly before various trade shows. In Table 3.1 fifty-five cents of the cost of every unit sold can be applied towards advertising. If the couple sells 1,000
units then they can spend $550.00 for advertising without affecting their total cost picture. If they can sell 1,000 units without spending any of the $550.00 allotted for advertising it will significantly enhance their profit per unit make up. Likewise, if they spend over $550.00 it will negatively impact their profit picture unless something else is overcome or they raise the selling price per unit. The couple will handle their promotions themselves and have already used the Madison Area Shopper and local community papers. They currently have the area addresses of the publishers and have both phoned and mailed in ad requests. They have used the system to their advantage and have been successful at getting maximum range and timeliness with minimal effort and cost. The couple believes their greatest potential for profit will be realized from direct sales at craft shows, and gift specialty sales.

Market Test

The couple will test the target market and marketing mix by installing twelve units on consignment in various outlets. This initial investment to produce 60 chimes, ten chimes of each pipe - galvanized and copper, is $817.80. The $817.00 is derived from taking the direct and variable
costs per unit times 10 units of each chime. Direct and variable costing were chosen because in the short run, a firm can operate by covering its variable costs of production. In this instance it gives a true picture of their actual costs. This test will include all six types of chimes. Those chimes to be made will include galvanized 1/4" , 1/2" and 3/4" pipe. It will also include chimes made from copper 1/4" , 1/2" and 3/4" tubing. This combination represents all combinations the couple currently makes.

G 1/4" = 10 x 11.63 = $116.30
G 1/2" = 10 x 12.63 = 126.30
G 3/4" = 10 x 13.63 = 136.30
C 1/4" = 10 x 13.63 = 136.30
C 1/2" = 10 x 14.63 = 146.30
C 3/4" = 10 x 15.63 = 156.30
60 $817.80

The test stores owners will be asked to obtain their customers' general opinion of the product to be passed on to the couple. Along with the first units produced, the couple will place a short survey questionnaire, postage paid, with the product for customer feedback. If this test proves successful, they will distribute the product directly with a five working day lead time for delivery.
varies greatly from the universe. Table 2.4. A second way to look at this example is to compare data from female purchases only against only the female population breakdown since male purchasers were not considered in the couple's assumptions. In this instance, the significance levels would be 1.6671 to the -4th power. Table 2.5. In this example the greatest area of difference comes from the female 30-40 group. The couple's assumption was that the area of major importance females 20-30 and 50+. This information would make you rethink the problem. To help in reformulating the problem a confidence level could be attached to the new age group of repeat sales. Again using the above in Table 2.5, the major difference was in females ages 30-40. There were 17 responses from this age group out of a total of 50. If you were to ask the questions - If you wanted to be 95% certain of repeat buyers of this age group at what level of sales percentage based from existing data could you expect from this group? The confidence level is developed using Binomial Probabilities. The upper confidence level is 48.77% and the lower limit is 21.21%. In the original data, 17/50 is 34%. What the information tells you is that from the responses in the 30-40 age group with 95% confidence you could expect between 21.21% and 48.77% purchases from this group. Table 2.6.
Chi-Square Goodness-of-Fit Test

<table>
<thead>
<tr>
<th>Observed Frequency</th>
<th>Expected Frequency</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>48.2</td>
<td>44.283</td>
</tr>
<tr>
<td>6</td>
<td>14.8</td>
<td>5.232</td>
</tr>
<tr>
<td>17</td>
<td>7.1</td>
<td>13.804</td>
</tr>
<tr>
<td>9</td>
<td>6.1</td>
<td>1.379</td>
</tr>
<tr>
<td>9</td>
<td>11.9</td>
<td>.707</td>
</tr>
<tr>
<td>7</td>
<td>10.7</td>
<td>1.279</td>
</tr>
</tbody>
</table>

Chi-Square = 66.6845 with 5 d.f.
Sig. level = 5.01044E-13

Table 2.4

Chi-Square Goodness-of-Fit Test

<table>
<thead>
<tr>
<th>Observed Frequency</th>
<th>Expected Frequency</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>14.8</td>
<td>5.232</td>
</tr>
<tr>
<td>17</td>
<td>7.1</td>
<td>13.804</td>
</tr>
<tr>
<td>9</td>
<td>6.1</td>
<td>1.379</td>
</tr>
<tr>
<td>9</td>
<td>11.9</td>
<td>.707</td>
</tr>
<tr>
<td>7</td>
<td>10.7</td>
<td>1.279</td>
</tr>
</tbody>
</table>

Chi-Square = 22.4015 with 4 d.f.
Sig. level = 1.6671E-4

Table 2.5

Confidence Level Testing

What is the total sample size? 50
How many responses from the survey? 17
What is the confidence level? (50 to 100) 95
One or two sided confidence interval (1,2)? 2
The upper confidence limit is 48.77%.
The lower confidence limit is 21.21%.

Table 2.6
Packaging

The couple has tried different packaging ideas. The method of packaging the chimes they like best consists of a heavy base cardboard. The top surface will be white and smooth and the bottom side will be unfinished grey. The white side will allow for printing as feasible. Costs for the cards including printing will be $0.10 to $0.20 per card with a minimum quantity order of 500. There is a one time setup charge of $50.00. Heat sensitive plastic covering per card will be $0.05 to $0.06. The package will be prepared by covering the items with "shrink" plastic and placing in the oven heated to 350°F for 3-5 minutes. Approximately 15 "cards" could be done at a time for shrinking.

As the couple expands production and gains experience, the learning curve may permit the development of chimes for seasonal markets whose prices could be raised above the 50% target markup. New variations to the original product could allow for product diversification. In this phase "added value" could be gained by using star patterns rather than the circular top with smaller metal stars on the lines connecting the pipes and a starshaped clanger. Imperative to actual start of production further items need to be addressed. The following section contains information on:
1. Cost of producing a unit.
2. Cost of production.
3. Total cost curve.
4. Selling price.
5. Break-even analysis.
6. Further look at substitutes and any effect on the curve.
7. Development of a customer survey card to identify customer satisfaction and any attributes needed for diversification.
Section 3

Costs of Production and Methods

Quantitative Analysis

The objective of this section will be to present:

1. Cost of producing a unit.
2. Cost of production.
3. Total cost.
4. Selling price.
5. Break-even point.

In Table 3.1, the cost of producing a unit is broken down by the six pipe sizes, as this represents the single biggest portion of the cost of the chimes. Direct material costs are $9.59 to $13.59 per unit. After the addition of variable costs, the per unit cost is $11.63 to $15.63. Fixed costs are $910.00. This represents legal fees, tax preparation, set up charges, and startup advertising. After fixed costs are added, the total product cost per unit is $13.13 to $17.13.

Selling price per unit assumes a 50 percent markup over cost. This was an original constraint of my client. The selling price per unit is now $19.70 to $25.70 per unit.
### Cost of Producing A Unit

<table>
<thead>
<tr>
<th></th>
<th>Gal-</th>
<th>Gal-</th>
<th>Gal-</th>
<th>Copper</th>
<th>Copper</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vanized</td>
<td>vanized</td>
<td>vanized</td>
<td>1/4&quot;</td>
<td>1/2&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Material</td>
<td>$6.00</td>
<td>$7.00</td>
<td>$8.00</td>
<td>$8.00</td>
<td>$9.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>Striker</td>
<td>.97</td>
<td>.97</td>
<td>.97</td>
<td>.97</td>
<td>.97</td>
<td>.97</td>
</tr>
<tr>
<td>Plate</td>
<td>2.30</td>
<td>2.30</td>
<td>2.30</td>
<td>2.30</td>
<td>2.30</td>
<td>2.30</td>
</tr>
<tr>
<td>Line</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
</tr>
<tr>
<td>Packaging</td>
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<td>.21</td>
<td>.21</td>
<td>.21</td>
<td>.21</td>
<td>.21</td>
</tr>
<tr>
<td><strong>Total Direct</strong></td>
<td><strong>$9.59</strong></td>
<td><strong>$10.59</strong></td>
<td><strong>$11.59</strong></td>
<td><strong>$11.59</strong></td>
<td><strong>$12.59</strong></td>
<td><strong>$12.59</strong></td>
</tr>
<tr>
<td>Utilities</td>
<td>$.23</td>
<td>$.23</td>
<td>$.23</td>
<td>$.23</td>
<td>$.23</td>
<td>$.23</td>
</tr>
<tr>
<td>Advertising</td>
<td>.55</td>
<td>.55</td>
<td>.55</td>
<td>.55</td>
<td>.55</td>
<td>.55</td>
</tr>
<tr>
<td>Taxes and Return</td>
<td>1.26</td>
<td>1.26</td>
<td>1.26</td>
<td>1.26</td>
<td>1.26</td>
<td>1.26</td>
</tr>
<tr>
<td><strong>Total Variable Costs</strong></td>
<td><strong>$11.63</strong></td>
<td><strong>$12.63</strong></td>
<td><strong>$13.63</strong></td>
<td><strong>$13.63</strong></td>
<td><strong>$14.63</strong></td>
<td><strong>$15.63</strong></td>
</tr>
<tr>
<td><strong>Fixed costs:</strong></td>
<td><strong>$1.50</strong></td>
<td><strong>$1.50</strong></td>
<td><strong>$1.50</strong></td>
<td><strong>$1.50</strong></td>
<td><strong>$1.50</strong></td>
<td><strong>$1.50</strong></td>
</tr>
<tr>
<td>Legal, Set Up, Tax Preparation, and Advertising</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Product Cost</strong></td>
<td><strong>$13.13</strong></td>
<td><strong>$14.13</strong></td>
<td><strong>$15.13</strong></td>
<td><strong>$15.13</strong></td>
<td><strong>$16.13</strong></td>
<td><strong>$17.13</strong></td>
</tr>
<tr>
<td>Selling Price</td>
<td>$19.70</td>
<td>$21.20</td>
<td>$22.70</td>
<td>$22.70</td>
<td>$24.20</td>
<td>$25.70</td>
</tr>
<tr>
<td>Suggested Retail</td>
<td>$25.95</td>
<td>$27.95</td>
<td>$29.95</td>
<td>$29.95</td>
<td>$31.95</td>
<td>$35.95</td>
</tr>
</tbody>
</table>

Table 3.1
Suggested retail price represents 100% markup over costs. The per unit retail sales price per unit is $25.95 to $35.95. This falls directly within the range of chimes that are now in the market place with a range of $15.00 to $45.00. This will allow for flexibility in designing new or different types of chimes and subsequent resulting price changes. The original concept in Table 3.1 also provides for variations in sales to be analyzed and current product lines to adjust according to sales.

Figure 3.1 contains the Break-even Analysis. The Sales Revenue curve was produced by taking an average sales price of $22.70 and multiplying it by units sold. The cost curve reflects the fixed costs of $910.00 with a curve of variable costs using an average of $13.63 times the number of units. The break-even point is approximately 175 units with sales revenue of $4,086.00. $4,086.00 is derived from linear interpolation between 2,270 and 4,540. (4,540 - 2,270 = 2,270 x .80 = 1,816 + 2,270 = $4,086.00)
BREAK-EVEN ANALYSIS

Profit at 500 Units is $1,636.00

Profit at 600 Units is $2,400.00

A = Profit at 500 Units is $1,636.00
B = Profit at 600 Units is $2,400.00

Figure 3.1
With the sale of 600 units, profit for the couple would be approximately $2,400.00. This divided by twelve months would be equal to additional income of $200.00 per month. At 1,000 units, net profit would be approximately $6,600.00 or $550.00 per month. This remains about $150.00 short of making up the loss of income due to retirement. This, with the amount of time they want to spend in this project, will have to be evaluated by them. The 1,000 units is well within the range of potential market capability determined in Section 2.

Capital Requirements

From Table 3.2, the needed capital for producing 1,000 units, including fixed costs is $15,130.00. The total cost is $16,013.00.

<table>
<thead>
<tr>
<th>CAPITAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Needed for Production - 1,000 Units</td>
</tr>
<tr>
<td>(1,000 x $15.13) (15.13 represents average production costs.)</td>
</tr>
<tr>
<td>Capital Needed Start-Up</td>
</tr>
<tr>
<td>Accounting, Legal Retainer Fees, Miscellaneous Materials (Represents Fixed Costs)</td>
</tr>
<tr>
<td>$16,013.00</td>
</tr>
</tbody>
</table>

Table 3.2
My clients have decided not to borrow funds at this time. The couple has elected not to borrow because they have a significant positive cash flow being generated currently and they have a substantial savings account balance and other investments that they can readily convert to cash if needed without penalty. The couple also feels that they can match production with sales demand to even the flow of income vs. expenses. If this is changed in the future, then the cost per unit can be changed to reflect the finance charges. This may be negligible due to the fact that included in the cost of the product (in taxes and return on investment) is included a provision for the return of reinvesting their $16,000.00 in this project. If interest rates continue to fall, this may also change their mind.

As previously stated, all projections are based from of average costs. All unit production costs are actual costs. Depending on the type of sales history the couple has for the first year, all of these tables can be redone to reflect actual sales. To help collect and utilize this information, a customer survey card (see Appendix 2) will be included with some of the units sold. This card will be used to correlate actual purchaser information to the market analysis procedure employed in Figures 2.3 and 2.4. Pertinent qualitative data can then be correlated with quantitative data to reflect the accuracy of the assumptions
carried in Sections 1 and 2. This information coupled with actual sales data will further help in determining the appropriate product matrix and which product is most lucrative and what cash cows can be avoided. It will also support what innovations or "added value" the consumers are willing to support.
Conclusion With Recommendation

The conclusion is that the couple go ahead with the project with one major stipulation. The couple should not build all 1,000 chimes at once but build and sell enough chimes throughout the year to suffice for their current income requirements. This will keep them from going into their savings in large quantities. It will also allow for correlation of sales data to actual production data and qualitative data. This will allow for much more quantitative analysis during year one and particularly for year two. The couple has a firm grasp of the requirements and what it will take to make, sell, and distribute the product. The making of the 1,000 units meets the requirement to remain active after during retirement and also fulfills their requirement to supplement their retirement income. First year requirements of production should keep as close to the original six styles (See Table 3.1) in fairly even quantities. If it becomes obvious that adjustments do need to be made, all tables, figures, and models can easily be changed to forecast new revenue and net profit figures. It should be noted that the cost structure and pricing was originally set so that small changes in different product quantities will not significantly skew the
curves or results. A total resultant change in product mix and prices the second year would significantly change and alter the basic cost and revenue assumptions made in the breakeven analysis. Example: Based off the figures in Table 3.1, if the couple would sell 1,000 1/4 inch galvanized chimes at the suggested prices, their profits would be $6,570.00. If they sold 1,000 3/4 inch copper chimes, their profit would be $8,570.00.

All projections fit within the qualitative or quantitative parameters set forth. The 1,000 units is well within a potential market of a possible 30,000 units given the target market. Production of 1,000 units will yield a net profit of $7,570.00. This divided by 12 months will yield additional income of $631.00 per month which satisfies some of the income requirements if they wish to keep it at the same level. The total product costs of $13.13 and $17.13 allows for the chimes to be sold well within the current market prices of $15.00 to $45.00.

The clients' request to do this project was based on the expectations derived from the fact that they have been moderately successful doing this at various craft shows now and they wanted to know the implications on a slightly larger scale. It should be further noted that the qualitative data when backed by quantitative analysis will
put the final knots on all project subject matter. The quantitative data will be partially supplied through actual cost data, revenue data and units sold. That is an income statement or profit and loss statement. Sales data will be compared to project assumptions and statistically correlated using the Chi Square Test. This test, in conjunction with significance levels, will provide the remainder of quantitative data.

The project is within:

1. Capital requirements.

2. Established time requirements (remain active and enjoy free time). The couple has made 75 chimes in one week.

3. Projected market capacity.

4. Partially meeting income requirements.
   (Additional units will mean adjustments to the time requirements.)

5. Ability for the couple to take over the administration of the quantitative aspect of the tables and figures. (Some help will be needed on interpretation of the customer survey.)

It was my recommendation that the couple go ahead and undertake this project. From going over the data and with their years of experience in craft shows, the couple feels very confident that they will succeed in this venture.
Secondly, the couple has no debt to speak of and can live very comfortably on their retirement income of $3,719.00 per month.

This retirement project fits all of the above requirements. It allows the couple to remain active and if they really decide to quit selling chimes they can leave the business and sell the remaining inventories. By phasing production of the chimes, the couple can walk away without any sizable capital investments or savings depletion and recover their investments in the project.
BIBLIOGRAPHY


Madison Area Chamber of Commerce.


APPENDICES
CONCEPT DESIGN
Production Requirements

1/16" • 1/16" • 1/16" • 1/16" • 1/16" HOLE

• 1/16" • 1/16" • 1/16" • 1/16" • 1/16"

1/4" X 3" Copper tubing
1/4" X 4" Copper tubing
1/4" X 5" Copper tubing
1/4" X 6" Copper tubing
1/4" X 7" Copper tubing

8 pound test line
Striker 2" galvanized or stainless
Center stabilizer

Appendix 1
CONCEPT DESIGN
Production Requirements

\[
\begin{align*}
\frac{3}{4}'' \times 3'' & \text{ Copper tubing} \\
\frac{3}{4}'' \times 4'' & \text{ Copper tubing} \\
\frac{3}{4}'' \times 5'' & \text{ Copper tubing} \\
\frac{3}{4}'' \times 6'' & \text{ Copper tubing} \\
\frac{3}{4}'' \times 7'' & \text{ Copper tubing} \\
8 \text{ pound test line} \\
\text{Striker 2'' galvanized or stainless} \\
\text{Center stabilizer}
\end{align*}
\]

Appendix 1
Appendix 1 (Continued)
Customer Survey Card

| Age of Purchaser       | __________________________ |
| Sex of Purchaser       | __________________________ |
| Income < $25,000       | __________________________ |
| > $25,000              | __________________________ |
| > $30,000              | __________________________ |
| > $45,000              | __________________________ |
| Currently Employed     | __________________________ |
| Store Where Purchased  | __________________________ |

Did you read about the chimes in:  
Madison Area Shopper ___  Newspaper ___
Local Shopper ___  Name: __________________________

Was this a planned purchase? ___
or an impulsive purchase? ___

Were you previously aware of this product?  
Yes ___  No ___  Somewhat ___

Thank you!

Appendix 2