

Fortune Business Planning Company- Cookie Package Size Decision

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Background:

Fortune Business Planning Company is a leading company in the city of Pittsburgh for business strategic planning and execution of the plans. Factories and Companies of small scale to large scale range approach us for their business decision making. Our company has been contacted by a cookie manufacturing store owner who does produce best chocolate chip cookies and distribute them to the giant distributors like Walmart, Giant eagle etc. in Pittsburgh. My Managing Director has handed over his file to me and asked to find the best solution to his problem. Looking into the details, the cookie company owner has been doing this business from the past two years and have not made good profits from that time.

Our client desires to know about the probabilities of packing cookies in various sizes and their demand over the market. He also mentioned that he wants to maximize the profits out of it. My Managing Director wants me create a Decision Support System considering three different scenarios (Small Size Package, Medium Size Package and Large Size Package) that would help the client to maximize his profits. Our client provided some important numbers from his previous experiences that will be helpful in forecasting the three scenarios.

- Number of distributors in the Pittsburgh who purchase the product would range from 5-15
- Price of each package would range from \$10- \$45
- Total number of products available to sell to each distributor: 4000-9500
- And also he provided few details of the store rental and equipment costs to manufacture the product

My three scenarios will mainly focus on the following questions and answers them:

- Which Package type would be best according to the client's requirement
- Ideal price for selling the packaged product

- Number of products sold to each distributor
- How much maximum possible profit would be made by my client by using the above factors?

Software Choice:

If we need to do some analysis on several different scenarios with our data, Scenario Manager will help us make it quick work. A Scenario is a set of values that Excel saves and can substitute automatically in cells on a worksheet. With Scenario Manager, we can enter the data and save it as a scenario. Then we can modify the data and save it as another scenario. We can go back and review previous scenarios and do a full comparison of all scenarios to see which option is best.

For finding a solution to the above mentioned problem in the background section, I strongly feel Scenario Manager will do the justification. Since the problem statement mentions that the client wants to know which package size is suitable for maximizing profits, we can consider various scenarios with the help of scenario manager. Hence in the Software Choice, I opted for Microsoft Excel 2016 using scenario manager as a solution to build the model. The software is openly available and also allows to enter various data inputs. And finally it shows the results by doing what-if Analysis.

Solution Design:

In this solution design model, I have used Scenario Manager to compare three sets of numerical values: Small Size Package, Medium Size Package and Large Size Packages and their associated costs and revenues, assuming each package sells out. And also these values are calculated on a yearly basis.

Initially, I created the spreadsheet where we can enter the inputs and perform calculations using cell formulas. In my model there are four sections for all the three above mentioned scenarios.

This model contains the following sections:

- Constants
- Inputs
- Summary of Key results
- Calculations

Constants Section: My spreadsheet contains the following in the constants section followed by the explanation of the line items:

CONSTANTS	
Store Rental Cost	\$50,000
Salary Per Worker Involved	\$30,000
Number of Workers Required	15
Store Equipment Costs	\$30,000
Insurance	\$8,000
Tax Rate	10%
Advertising Costs	\$800

- Store Rental Cost – The rent that my client has to pay to the store lease annually
- Salary Per Worker Involved – The yearly salary of each worker employed in the store
- Number of Workers Required – Total number of workers needed to complete the task of making and packing cookies is expected to be 15 members
- Store Equipment Costs – The cost of machinery involved for making and packing the cookies annually
- Insurance – The Insurance paid to the store annually for safety purposes
- Tax Rate – The tax includes state and federal tax applicable per annum is expected to be 10%
- Advertising Costs – The annual costs spend on advertising the packaged products

Inputs Section: As explained earlier, my model answers two important questions. First, which type of package should the client choose depending on number of products sold and second the profit margin. My spreadsheet contains the following input section:

INPUTS	
Electricity Charges	\$9,000
Water Supply Charges	\$6,000
Material Cost for Product Preparation(Flour, Sugar, Chocolate chips, Milk, etc)	\$14,000
Material Transportation Charges	\$5,000
Packing Costs	\$5,500
Shipping Charges	\$7,000
Price of Each Package	\$45
No of Packages Sold to Each Distributor	4,000
Number of Distributors(Eg: Walmart, Giant Eagle)	5

This section of values keeps changing for each scenario and the explanation of the line items is as below:

- Electricity Charges – Enter the dollar value for the annual electric expenses of the cookie store
- Water Supply Charges – Enter the dollar value of annual water charges that are being supplied to the store
- Material Cost for Product Preparation – Enter the dollar amount for the annual cost of the ingredients like flour, sugar, chocolate chips, milk etc. to make the products (cookies)
- Material Transportation Charges – Enter the dollar value for the annual cost to transport the ingredients from the market to the cookie making store
- Packing Costs – Enter the dollar amount for the annual cost to pack the cookies in the decorative boxes of various sizes
- Shipping Charges – Enter the dollar amount for the annual cost to ship the final packed products to the distributors over the market
- Price of Each Package – Enter the assumed final price for each package

- No of Packages Sold to Distributor – Enter the count of the total packages that will be supplied to each distributor annually
- Number of Distributors – Enter the count of the total number of distributors in the Pittsburgh city that the final packed product will be supplied to

Summary of Key Results: My spreadsheet contains the following Summary which helps us take a decision by looking at the numbers. These values are calculated elsewhere and are echoed here.

SUMMARY OF KEY RESULTS	
Total Expenses After Taxes	\$643,830
Total Revenue After Taxes	\$810,000
Profit or Loss Margin	\$166,170

For each scenario, my spreadsheet will compute total expenses after taxes, total revenue generated from the product sales after taxes and also the profit or loss margin which is equal to Total Revenue After Taxes - Total Expense After Taxes (positive values represent profits and negative values represent loss margin)

Calculations: My spreadsheet calculates the amounts given below using cell reference formulas

Calculations	
Costs	
Number of Workers Required	15
Total Cost for Salaries of Workers	\$450,000
Utility Expenses	\$15,000
Packing and Shipping Charges	\$12,500
Material Expenses	\$19,000
Store Maintenance Costs	\$88,000
Advertising Costs	\$800
Total Expense Before Taxes	\$585,300
Income Tax Expense	\$58,530
Total Expense After Taxes	\$643,830
Revenue	
Total Revenue from Products Sold	\$900,000
Total Revenue Before Taxes	\$900,000
Income Tax Expense	\$90,000
Total Revenue After Taxes	\$810,000
Profit or Loss Margin	\$166,170

- Total cost for salaries of workers= Number of workers * Salary Per Worker involved

- $\text{Utility Expenses} = \text{Electricity Charges} + \text{Water Supply Charges}$
- $\text{Material Expenses} = \text{Material Cost for Product Preparation} + \text{Material Transportation Charges}$
- $\text{Store Maintenance Costs} = \text{Store Rental Cost} + \text{Store Equipment Costs} + \text{Insurance}$
- $\text{Total Expense Before Taxes} = \text{Total Cost for Salaries of Workers} + \text{Utility Expenses} + \text{Packing and Shipping Charges} + \text{Material Expenses} + \text{Store Maintenance Costs} + \text{Advertising Costs}$
- $\text{Income Tax Expense} = \text{Total Expense Before Taxes} * \text{Tax Rate}$
- $\text{Total Revenue from Products Sold (Revenue before taxes)} = \text{Price of Each Package} * \text{No of Packages Sold to Each Distributor} * \text{Number of Distributors}$

Solution Implementation:

Creating Scenarios for Decision Support System

My client wants to maximize profits, so we are interested in the following three test scenarios. The scenarios are based on the sizes of packaged cookies and are calculated on an annual basis:

- 1. Small Size Package** - Assuming that the price of each package is \$10, Number of distributors will be 15, Electricity Charges is \$5,000, Water Supply Charges as \$2,000, Material Cost for Product Preparation is \$8,600, Material Transportation Charges is \$2,200, Packing Costs is at \$2,500, Shipping Charges at \$4,200 and No of Packages sold to each distributor is at 9500.
- 2. Medium Size Package** - Assuming that the price of each package is \$22, Number of distributors will be 9, Electricity Charges is \$7,000, Water Supply Charges as \$3,500, Material Cost for Product Preparation is \$10,500, Material Transportation Charges is \$3,000, Packing Costs is at \$3,500, Shipping Charges at \$5,800 and No of Packages sold to each distributor is at 5500.

- 3. Large Size Package** - Assuming that the price of each package is \$45, Number of distributors will be 5, Electricity Charges is \$9,000, Water Supply Charges as \$6,000, Material Cost for Product Preparation is \$14,000, Material Transportation Charges is \$5,000, Packing Costs is at \$5,500, Shipping Charges at \$7,000 and No of Packages sold to each distributor is at 4000.

Results:

In order to maximize profits for our client, we entered different numbers to test the following three scenarios. The Cookie Store Company can go through the results for each scenario listed below:

Small Size Package: In this scenario, we made the price of the package to be a minimal cost of \$10 with a total of 15 distributors willing to purchase the 9500 packaged products each annually. Total expenses by choosing small size package after taxes is \$619,630 and Revenue from selling the packaged product is \$1,282,500, making a huge profit of \$662,870. In this scenario, the client gets twice the expenses as revenue and also a maximum profit with minimal expenses.

Medium Size Package: In this scenario, we made the price of the package to be a nominal cost of \$22 with a total of 9 distributors willing to purchase the 5500 packaged products each annually. Total expenses by choosing medium size package after taxes is \$629,310 and Revenue from selling the packaged product is \$980,100 which is a bit closer to the expenses, making a minimal profit of \$350,790 annually. In this scenario the client gets a decent profit with a bit higher expenses.

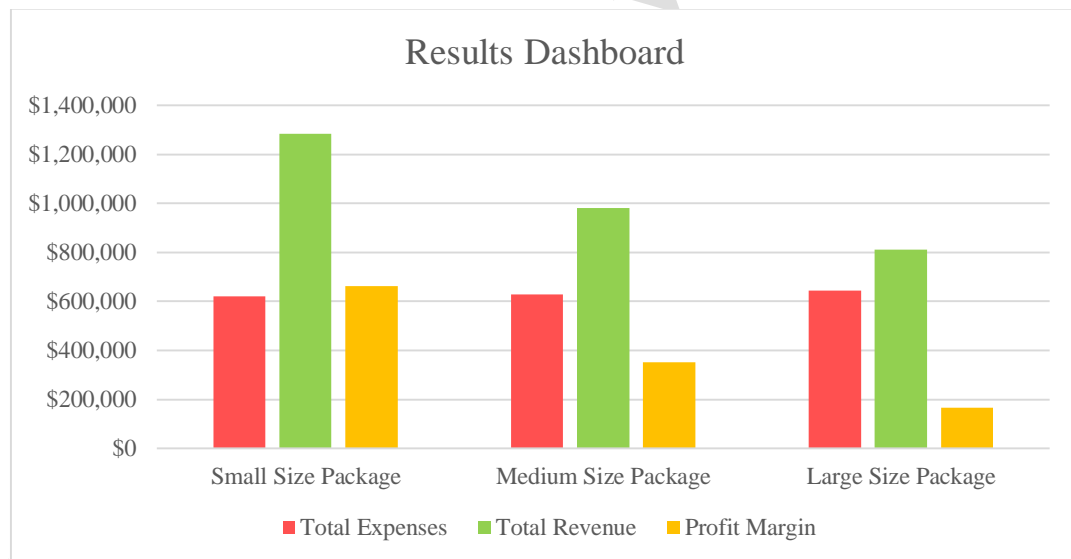
Large Size Package: In this scenario, we made the price of the package to be a higher value of \$45 with a total of 5 distributors willing to purchase the 4000 packaged products each. Total expenses by choosing large size package after taxes is \$643,830 and Revenue

from selling the packaged product is \$810,000, making a very minimal profit of \$166,170.

In this scenario, the client gets a low profit with higher expenses.

Scenario Summary				
	Current Values:	Small Size Package	Medium Size Package	Large Size Package
Changing Cells:				
Electricity Charges	\$9,000	\$5,000	\$7,000	\$9,000
Water Supply Charges	\$6,000	\$2,000	\$3,500	\$6,000
Material Cost for Product Preparation	\$14,000	\$8,600	\$10,500	\$14,000
Material Transportation Charges	\$5,000	\$2,200	\$3,000	\$5,000
Packing Costs	\$5,500	\$2,500	\$3,500	\$5,500
Shipping Charges	\$7,000	\$4,200	\$5,800	\$7,000
Price of Each Package	\$45	\$10	\$22	\$45
No of Packages Sold to Each Distributor	4,000	9,500	5,500	4,000
Number of Distributors	5	15	9	5
Result Cells:				
Total Expense After Taxes	\$643,830	\$619,630	\$629,310	\$643,830
Total Revenue After Taxes	\$810,000	\$1,282,500	\$980,100	\$810,000
Profit or Loss Margin	\$166,170	\$662,870	\$350,790	\$166,170

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.



I would recommend considering Small Size Package compared to other package sizes.

Even though the profits from all the three cases are positive and gives good returns as shown in the scenario manager and results dashboard, the small size packages will produce maximum profits with minimal expenses which is the best indication to any business.