

Product Profitability Template: User Instructions

Welcome to your customized ModelSheet Template! We are delighted that you have chosen ModelSheet to get the most out of your spreadsheet models. In order to use your ModelSheet template effectively, we urge you to take a few minutes to read the description of what the template contains and the tips for using the template.

Contents

1	What the Product Profitability Template Contains	2
1.1	Product Contribution Margin Reports	2
1.2	Other Worksheets: Data Inputs Worksheet, Formulas Worksheet, and Labels Worksheet	2
1.3	The Product Profitability Model Is Made Up of Sub Models	2
1.3.1	<i>Revenue Sub Model</i>	3
1.3.2	<i>Cost of Goods Sold (COGS) Sub Model</i>	3
1.3.3	<i>Royalties Paid Sub Model</i>	3
1.3.4	<i>Marketing Expense Sub Model</i>	3
1.3.5	<i>Engineering/Product Development Expense Sub Model</i>	3
1.3.6	<i>Customer Support Sub Model</i>	4
2	How to Use the Product Profitability Template	4
2.1	How to Use the Worksheets	4
2.2	Understanding How the Model Works: Variables and Formulas Relating Variables	6
2.2.1	<i>How to Use Excel Comments</i>	6
2.2.2	<i>How to Use the Formulas Worksheet to Understand Variables in the Model</i>	7
2.2.3	<i>How to Use the Labels Worksheet to Understand Variables and Dimensions in the Model</i>	9
3	How to Enter and Edit Data in the Product Profitability Template	10
3.1	How to Enter Data in the “Inputs Worksheet”: Data Entry Tips	11
3.2	How to Edit Display Names, Comments, and the Model Start Date in the “Labels Worksheet”	12
3.3	Note on Times to Open Excel Workbooks	14
3.4	Note on Excel Error Codes in Templates without Data	14
4	License Terms	14

The introductory webpage for the Product Profitability template is
<http://templates.modelsheetsoft.com/modelsheettemplates/product-profitability-templates.aspx>.

5/17/2010

1 What the Product Profitability Template Contains

This workbook contains your customized (and customizable!) Product Profitability Template. The Product Profitability Template is a model that computes each product's *contribution margin* for a company's portfolio of products. The contribution margin for each product is defined as the product revenue for each product minus variable and fixed components of product Cost of Goods Sold, as well as marketing, product development, and customer support costs that can be allocated to each product. The product contribution margins enable you to see how much any product contributes to your company's bottom line over time, and also to quantify the cost drivers for each product's profitability.

1.1 Product Contribution Margin Reports

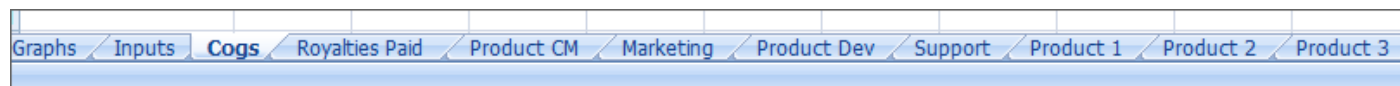
The major outputs of the Product Profitability Model are the following profitability reports: a *Product Contribution Margin Summary Report*, and a *Product Contribution Margin Report* for each product.

In addition to these profitability reports, the Model also generates *Graphs* and detailed reports of the components—the line items—that determine each product's profitability: *Cost of Goods Sold*, *Royalties Paid*, *Product Development Expense*, *Marketing Expense*, and *Customer Support Expense* for each product.

- **Note:** Only the advanced versions of the Product Profitability Template have detailed contribution margin reports for each product, and a royalties report. In addition, the advanced versions have more detailed versions of the “line item” reports that describe the component costs of each product.

Each of these outputs (summary report, detailed reports, and graphs) has a worksheet devoted to it. You access these worksheets by clicking on the appropriately labeled tab at the bottom of the workbook, as shown in Figure 1.

Figure 1: Product Profitability Reports Worksheet Tabs



Clicking on the “Cogs” tab, for example, opens up the Cost of Goods Sold Worksheet.

1.2 Other Worksheets: Data Inputs Worksheet, Formulas Worksheet, and Labels Worksheet

The Product Profitability workbook also contains the following worksheets which enable you to get the most value out of your template.

- *Data Inputs Worksheet:* This worksheet allows you to enter and update your own data. It is discussed in Section 3.1, [How to Enter Data in the “Inputs Worksheet”: Data Entry Tips](#).
- *Formulas Worksheet:* This worksheet lists the variables used in the model and the formulas that define those variables in alphabetical order. It is discussed in Section 2.3.2, [How to Use the Formulas Worksheet to Understand Variables in the Model](#).
- *Labels Worksheet:* This worksheet lists the variables used in the model in alphabetical order and displays verbal definitions which define and explain those variables. It also contains a listing of the dimensions used in the model and the variables to which they apply. The Labels Worksheet is discussed in Section 2.3.3, [How to Use the Labels Worksheet to Understand Variables and Dimensions in the Model](#).

1.3 The Product Profitability Model Is Made Up of Sub Models

The Product Profitability Model can be viewed as being made up of smaller models (“Sub Models”) that generate the detailed component reports mentioned above: Cost of Goods Sold, Royalties, Marketing, Product Development, and Customer Support.

- **Note:** The Standard version of the Product Profitability Template has less detailed versions of these component Sub Models.

These Sub Models include the following features.

1.3.1 Revenue Sub Model

Although it does *not* have a separate worksheet, the Revenue Sub Mode is the obvious starting point for any product profitability analysis—no revenue, no profits, after all. The Revenue Sub Model computes product revenue and product unit sales segmented by product and time period. For each product, product revenue is simply average selling price times the number of units sold. You can specify the number of units sold each time period or specify an initial number of units and unit growth rates for subsequent periods. Product unit sales may also enter into the calculations of the Cost of Goods Sold and Royalties Sub Models discussed below.

1.3.2 Cost of Goods Sold (COGS) Sub Model

The Cost of Goods Sold (COGS) Sub Model computes the product “production” cost of goods sold for each product and time period and includes both variable and fixed costs. For variable costs, the COGS Sub Model tracks direct material, direct labor, and overhead costs, and allows these variable cost components to be specified either on a per unit basis or as a percent of product revenue (or as a combination of both). The COGS Sub Model also tracks fixed costs—period costs that do *not* in general vary with unit volumes—that can be assigned to each product. The three costs (variable per unit, variable as a percent of revenue and fixed) are added together to get the total “production” COGS for each product. Royalty costs for each product (discussed below) are added to the total “production: COGS for each product to get the Total COGS for each product.

1.3.3 Royalties Paid Sub Model

The Royalties Paid Sub Model computes royalty costs for each product by time period, and includes variable and fixed components. You can specify the variable components on a per unit basis or as a percent of product revenue. You can also specify the fixed royalty cost components (those that require minimum period payments regardless of sales volume, for example) for each time period. These royalty costs (per unit, percent of revenue, and fixed) are then added together to get the total royalty costs for each product. The royalty costs for each product are then added to the “production COGS” for each product to get the Total COGS for each product.

1.3.4 Marketing Expense Sub Model

The Marketing Expense Sub Model computes the marketing expenses that can be associated with each product. It is driven by marketing employee headcount, wages, and marketing program expenses devoted to each product.

- *Headcount*: You specify the marketing headcount associated with each product for each employee level.
- *Wages*: You specify the average yearly wage for each employee level, the annual growth rate for those wages, and the average wage related overhead expense expressed as a percentage of wages.
- *Marketing Programs*: You specify the period cost of each kind of marketing program for each product—for example trade shows, seminars, or product promotions. You can have the cost of programs grow with the revenue growth rate associated with each product, or you can specify the program costs directly.

1.3.5 Engineering/Product Development Expense Sub Model

The Engineering Sub Model computes the engineering and product development expense associated with each product. It is driven by engineering employee headcount, wages, engineering program expenses, and engineering equipment overhead expenses devoted to each product.

- *Headcount*: You specify the engineering headcount associated with each product for each employee level and engineering team.
- *Wages*: You specify the average yearly wage for each employee level and engineering team, the annual growth rate for those wages, and the average wage related overhead expense expressed as a percentage of wages.
- *Engineering Programs*: You specify the period cost of each kind of engineering program for each product—for example, conferences and seminars,. You can have the cost of programs grow with the revenue growth rate associated with each product, or you can specify the program costs directly.
- *Engineering IT Overhead*: You specify the average period cost of engineering information technology equipment associated with each engineering headcount.

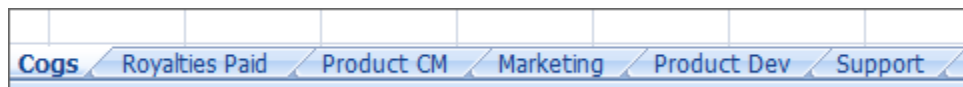
1.3.6 Customer Support Sub Model

The Customer Support Sub Model is the most complex and detailed of the sub models of the cost components that determine product profitability. Its intent is to enable you to track and analyze the issues that are crucial in determining customer satisfaction with a given product. The sub model is driven by the number of support employees per product and the average wages of each level of employee. The number of support employees is a function of expected number of support hours per year required to support each product. The expected number of support hours per year is in turn depends on the number and kinds of support calls or cases associated with each product as well as the distribution of resolution times associated with each kind of call or case.

- *Number of Support Calls/Cases:* For each product, you specify the number of support calls or cases per period broken out by problem type (e.g., installation or ongoing maintenance) and duration category of time to resolution (e.g., short, medium, long, and very long). By default, the number of support calls or cases tracks revenue growth over time, so you only have to specify the initial values, but you can also override the default values if you wish.
- *Resolution Times:* You specify the average resolution time in hours for each duration category. Given the average resolution times and the number of calls in each duration category for each problem type for each product, the expected number of support hours for each product can be computed.
- *Headcount:* For each employee, you specify the target number of support hours per year per employee for each employee level—the “full utilization” level. The Sub Model computes the number of employees at each employee level required to support each product by dividing the expected support hours by the target full utilization level.
- *Wages:* You specify the average yearly wage for each employee level, the annual growth rate for those wages, and the average wage related overhead expense expressed as a percentage of wages.

Each of these Sub Models has a worksheet devoted to the reports it produces. You access these worksheets by clicking on the appropriately labeled tab (the names correspond to the names of the Sub Models) at the bottom of the workbook, as shown in the Figure 2.

Figure 2: Sub Model Reports Worksheet Tabs

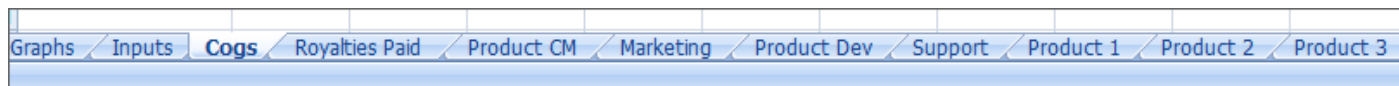


2 How to Use the Product Profitability Template

2.1 How to Use the Worksheets

The Product Profitability Template is organized as a series of worksheets, with each worksheet containing a set of output reports generated by the Product Profitability Model or one of its Sub Models. You access any of these worksheets by clicking on the appropriately labeled tab at the bottom of the workbook as illustrated in Figure 3.

Figure 3: Product Profitability Template Worksheet Tabs



Clicking on the "Cogs" tab, for example, opens up the "Cost of Goods Sold" Worksheet, a portion of which is shown in Figure 4.

Figure 4: COGS Worksheet--Collapsed View

	1	2	3	A	B	C
	1	ABC Corp.				
	2	1/1/2009 to 12/31/2011				
	3	Cost of Goods				
	4					
+	5	<u>Summary by Product</u>				
	15					
+	16	<u>Cost of Goods by Product and Cost Type</u>				
	42					
-	43	<u>Cost of Goods Detail</u>				
.	44					
+	45	Cogs specified per unit sold				
+	70	Cogs specified as % of revenue				
+	95	Fixed Cogs				
.	142					

You will note that the worksheet displays an overview, or summary view of the report's contents. This is the worksheet's "collapsed view". It shows a list of titles of the detailed reports it contains. These titles also indicate how the contents of the COGS worksheet are organized. You can see at a glance, for instance, what reports the "Cost of Goods Detail" section contains. Clicking on any of the "+" signs to the left of each title causes a more detailed report to appear, with contents corresponding to the title. For example, clicking the "+" sign next to "Summary by Product" causes the Summary COGS report by product to appear, as shown in Figure 5.

Figure 5: COGS Worksheet--Summary by Product Report Opened

	1	2	3	A	B	C	D	E	F	G
	1	ABC Corp.								
	2	1/1/2009 to 12/31/2011								
	3	Cost of Goods								
	4									
-	5	<u>Summary by Product</u>								
.	6									
.	7		Q1 2009	Q2 2009	Q3 2009	Q4 2009	2009	Q1 2010		
.	8	Cost of Goods								
.	9	Product A	\$447,700	\$479,004	\$512,458	\$548,320	\$1,987,482	\$586,676		
.	10	Product B	\$552,027	\$612,774	\$680,243	\$755,079	\$2,600,122	\$838,186		
.	11	Product C	\$91,600	\$94,365	\$97,209	\$100,132	\$383,306	\$103,134		
.	12	Total	\$1,091,327	\$1,186,143	\$1,289,910	\$1,403,531	\$4,970,910	\$1,527,996		
.	13									
.	14									
.	15									
+	16	<u>Cost of Goods by Product and Cost Type</u>								
	42									
-	43	<u>Cost of Goods Detail</u>								
.	44									
+	45	Cogs specified per unit sold								
+	70	Cogs specified as % of revenue								
+	95	Fixed Cogs								
.	142									

Note that the "+" sign next to the underlined Summary by Product title is now a "-" sign, indicating that the "Summary by Product" report has been opened. Clicking on the "-" sign will close the report and return the worksheet to its "collapsed" state.

Most (though not all) of the worksheets in the Product Profitability Template are set up in this manner: a collapsed view with detailed reports that can be opened up. We recommend you open no more than one or two detailed reports at any given time. Opening up too many detailed reports at once can give you the sense of drowning in a sea of information.

2.2 Understanding How the Model Works: Variables and Formulas Relating Variables

The Model underlying the Product Profitability Template is powerful and flexible because it is built in terms of named variables and formulas that relate those variables. In this context, a “named variable” is simply the name of any particular business concept: “Contribution Margin” for example. A “Formula” is simply a way of defining the business concept by relating it to other business concepts. The “Contribution Margin” for each product can be defined through the formula, “Product Revenue for each product minus variable and fixed components of product Cost of Goods Sold, as well as marketing, product development, and customer support costs that can be allocated to each product”. “Product Revenue” can be defined through the formula “Average Sales Price of a Product” times the number of “Product Units” sold. If these examples sound obvious, that is precisely the point. We usually think in terms of concepts and formulas that relate those concepts, and not in terms of cell locations (“H23”) and cell location-based computational formulas (“H23 = F23*E18”). You can save a lot of time and effort and get the greatest benefit from your template by understanding how the Product Profitability Model is driven by variables and the formulas that define those variables through other variables, rather than by cell locations and formulas based on cell locations.

- ✓ The Formulas Worksheet contains a complete alphabetical listing of the Model’s variables and the formulas defining those variables. This worksheet is discussed in Section 2.3.2 *How to Use the Formulas Worksheet*.

This template has a number of features to help you understand how the Product Profitability Model works: “floating” Excel Comments, a “Formulas Worksheet”, and a “Labels Worksheet”.

2.2.1 How to Use Excel Comments

Each variable in the Model has an Excel Comment attached to the worksheet cell that displays the name of that variable. Each Comment explains what the variable is and often tells you how it is used in the Model. At the end, each Comment displays the “formula name” of that variable, if the formula name differs from the displayed name.¹ The presence of an Excel Comment is indicated by a small red triangle in the upper right corner of the cell containing the variable display name. For example, the “COGS Worksheet--Summary by Product Report Opened” in Figure 5 shows a red triangle in the cell in the leftmost column showing the variable display name “Cost of Goods”. Moving the mouse cursor over the cell, or left-clicking on the cell, causes the Excel Comment to appear. An example of an Excel Comment is shown in Figure 6 for the variable display name “Cost of Goods ”.

¹ Display names are set to whatever is most helpful in the Excel workbook. The formula names must be unique, descriptive, and contain no spaces. Therefore each variable in the Model has a display name that appears in Excel, and a formula name that appears in the underlying ModelSheet formulas.

Figure 6: Excel Comment for the Variable Display Name "Cost of Goods"

2	1/1/2009 to 12/31/2011					
3	Cost of Goods					
4						
5	<u>Summary by Product</u>					
6						
7		Q1 2009	Q2 2009	Q3 2009	Q4 2009	2009
8	Cost of Goods					
9	Product A	\$447,700	\$479,004	\$512,458	\$548,320	\$1,987,482
10	Product B	\$552,027	\$612,774	\$680,243	\$755,079	\$2,600,122
11	Product C	\$91,600	\$94,365	\$97,209	\$100,132	\$383,306
12	Total	\$1,091,327	\$1,186,143	\$1,289,910	\$1,403,531	\$4,970,910
13						
14						
15						
16	<u>Cost of Goods by Product and Cost Type</u>					
42						
43	<u>Cost of Goods Detail</u>					
44						
45	Cogs specified per unit sold					
70	Cogs specified as % of revenue					
95	Fixed Cogs					
142						

Cost of goods, segmented by product and cost factor (material, labor, overhead), by time period.

In the general case of this model, COGS has three components: variable COGS (that scales with units produced), fixed COGS (that do not depend on units produced, such as a factory lease), and COGS as a percent of revenue. If your model has two or three of these types of COGS, the three types are added to get total cost of goods.
(variable Cost_of_Goods)

In this example, the variable is explained in the Comment and you are told how it is computed—in this case, through its component variables. The actual variable name, called the “Formula name” (“Cost_of_Goods”), is given in parenthesis at the end of the Comment.

- ✓ **Note:** Each variable has a “Formula Name” (such as " Cost_of_Goods ") which the Model actually uses in its calculations and a “Display Name” (such as "Cost of Goods") which is the more "user-friendly" name that appears throughout the workbook. See Section 2.2.2 [How to Use the Formulas Worksheet](#) for more information about how the Model uses formula names of variables in its calculations rather than cell addresses. See Section 3.2 [How to Edit Display Names, Comments, and the Model Start Date in the “Labels Worksheet”](#) for instruction on how to change variable display names.

2.2.2 How to Use the Formulas Worksheet to Understand Variables in the Model

This worksheet displays the formula for each variable, arranged alphabetically by the Formula Names of the variables. A small portion of the top of the “Formulas Worksheet” is depicted in Figure 7.

Figure 7: A Small Portion of the "Formulas Worksheet"

1	ABC Corp.			
2	1/1/2009 to 12/31/2011			
3	Variable	Display As	Dimension Index	Formula / Data
4	Cogs_on_Revenue	Cogs on Revenue	Cogs_Types, Products	Data: Cost_of_Goods_pct_Rev*Revenue
5				
6	Cogs_on_Units	Cogs on Units	Products, Cogs_Types	Data: Cost_of_Goods_Var_per_U*Sales_Units
7				
8	Company_Name	Company Name		
9				
10	Contrib_Margin	Contribution Margin	Products	Data: Revenue-Cost_of_Goods-Royalties_Paid-Eng_Exp_Alloc-Mktg_Exp_Alloc-Supp_Exp_Alloc
11				
12	Contrib_Margin_pct	Contribution Margin %	Products	Roll-up: Contrib_Margin/Revenue
13				
14	Contrib_Margin_pct_plt	Contribution Margin %	Global	Roll-up: Contrib_Margin_pct
15				
16	Contrib_Margin_plt	Contribution Margin	Global	Data: Contrib_Margin
17				
18	Cost_of_Goods	Cost of Goods	Products, Cogs_Types	Data: Cogs_on_Units+Cogs_on_Revenue+Cost_of_Goods_Fixed

Contribution margin is revenue less cost of goods less operating expenses that are directly attributable to a product, segmented by product and cost factor, by time period
(variable Contrib_Margin)

For each variable:

- The first column shows the variable's Formula Name.
- The second column shows the variable's Display Name. If the meaning of a variable is unclear, you can mouse over its display name and view the Excel Comment which defines it, as in the case of "Contribution Margin," shown in Figure 7.
- The third column shows the "Dimension Index" that defines in what parts of the domain of the variable the formula applies.
- ✓ **Note:** Dimensions in ModelSheet can best be understood as a way of segmenting and organizing variables. Cost of Goods, for example, can be aggregated along the dimensions of product, kinds of costs (e.g., fixed, or variable), and time. See Section 2.2.3 [How to Use the Labels Worksheet to Understand Variables and Dimensions in the Model](#) for more information on the use of dimensions in the Model.
- The fourth column shows the formulas that compute the values of the variable in *relation to other variables*, rather than in terms of cell addresses.

It is worthwhile to take a moment to ponder and decipher one of these formulas. In general, the formulas are less formidable than they appear, and far easier to understand and grasp than formulas based on cell addresses. This is especially true if you mouse over the display name (see the "Contribution Margin" Excel Comment in Figure 7) to get a verbal definition of the variable as well. To take the formula for calculating Contribution Margin as an illustration, you can see that Contribution Margin is expressed as a function of (Product) Revenue, and the various costs (fixed, variable, and headcount-related) that can be allocated to a particular product. Contribution Margin =

$$\text{Revenue} - \text{Cost_of_Goods} - \text{Royalties_Paid} - \text{Eng_Exp_Alloc} - \text{Mktg_Exp_Alloc} - \text{Supp_Exp_Alloc}$$

You can also mouse on the display names of the variables in the formula for Contribution Margin to get *their* definitions and formulas. Figure 8 illustrates the result of mousing on the Display Name "Cost of Goods" in the Formulas worksheet. In this manner, you can get a sense of how the variables interrelate with each other.

Figure 8: Cost of Goods Formula and Definition in the "Formulas Worksheet"

Contrib_Margin_pct_plt	Contribution Margin %	Global	Roll-up: Contrib_Margin_pct
Contrib_Margin_plt	Contribution Margin	Global	Data: Contrib_Margin
Cost_of_Goods	Cost of Goods	Products, Cogs_Types	Data: Cogs_on_Units+Cogs_on_Revenue+Cost_of_Goods_Fixed
Cost_of_Goods_Fixed	Fixed Cost of Goods	Products, Cogs_Types	Data: preve(0
Cost_of_Goods_pct_Rev	Cost of Goods % Rev	Products, Cogs_Types	Data: preve(0
Cost_of_Goods_plt	Cost of Goods	Global	Data: Cogs_o
Cost_of_Goods_Var_per_U	Var Cost of Goods / Unit	Products, Cogs_Types	Data: preve(0 Roll-up: ifm(isles
Cost_of_Sales_Total	Total Cost of Sales	Products	Data: Cost_o
Eng_Exp_Alloc	Engineering / R&D Expense	Products	Data: Eng_Labor_Exp_Alloc+Eng_IT_OH+Eng_Pgm_Expense

Cost of goods, segmented by product and cost factor (material, labor, overhead), by time period.

In the general case of this model, COGS has three components: variable COGS (that scales with units produced), fixed COGS (that do not depend on units produced, such as a factory lease), and COGS as a percent of revenue. If your model has two or three of these types of COGS, the three types are added to get total cost of goods. (variable Cost_of_Goods)

We can now translate the Contribution Margin formula into English:

For each product, that product's contribution margin is that product's revenue minus

Fixed and variable materials, labor and overhead Cost of Goods associated with that product minus

Fixed and variable royalties allocated to the product minus

Engineering headcount related expenses, program expenses, and IT overhead expenses that can be allocated to the product minus

Marketing headcount related expenses and program expenses that can be allocated to the product minus

Support headcount related expenses (driven by the number and duration of support incidents related to the product).

Expressing variable calculations in terms of other variables, and making the meaning of these variables transparent through the use of Excel Comments, help to make the workings of the Model more accessible and understandable, notwithstanding its size and complexity.

2.2.3 How to Use the Labels Worksheet to Understand Variables and Dimensions in the Model

The Labels Worksheet is divided into two parts: top and bottom. The top portion displays the Model's *variables* arranged alphabetically by the variables' Formula Names; the bottom portion displays the Model's *dimensions* arranged alphabetically by the dimensions' Formula Names.

In the top portion of the worksheet, the first column lists the variables alphabetically by Formula Name; the second column shows the corresponding variable Display Name, and the third column shows the variables' definitions (the same definitions as in the Excel Comments). This tabular presentation of variables and their definitions provides the quickest way to get an overview of the Model's contents. Figure 9 shows part of the top portion of the "Labels Worksheet".

Figure 9: Top (Variables) Portion of the "Labels Worksheet"

ABC Corp. 1/1/2009 to 12/31/2011			
Model Start	1/1/2009		
Variable	Display Label		Comment
Cogs_on_Revenue	Cogs on Revenue		Portion of cost of goods that is computed as a percentage of revenue
Cogs_on_Units	Cogs on Units		Portion of cost of goods that is computed on a per-unit basis
Company_Name	Company Name		
Contrib_Margin	Contribution Margin		Contribution margin is revenue less cost of goods less operating expenses that are directly attributable to a product, segmented by product and cost factor, by time period
Contrib_Margin_pct	Contribution Margin %		Contribution margin / revenue, segmented by product, by time period
Contrib_Margin_pct_plt	Contribution Margin %		Contribution margin / revenue, segmented by product, by time period.
Contrib_Margin_plt	Contribution Margin		This variable is used only to support plotting. Contribution margin is revenue less cost of goods less operating expenses that are directly attributable to a product, segmented by product and cost factor, by time period.
Cost_of_Goods	Cost of Goods		This variable is used only to support plotting. Cost of goods, segmented by product and cost factor (material, labor, overhead), by time period. In the general case of this model, COGS has three components: variable COGS (that scales with units produced), fixed COGS (that do not depend on units produced, such as a factory lease), and COGS as a percent of revenue. If your model has two or three of these types of COGS, the three types are added to get total cost of goods.
Cost_of_Goods_Fixed	Fixed Cost of Goods		Fixed cost of goods, by product, by COGS type, by time period. This is added to COGS per unit and COGS as % revenue to get cost of goods. In the general case of this model, COGS has three components: variable COGS (that scales with units produced), fixed COGS (that do not depend on units produced, such as a factory lease), and COGS as a percent of revenue. If your model has two or three of these types of COGS, the three types are added to get total cost of goods.

The bottom Portion of the "Labels Worksheet" shows the *dimensions* used in the Product Profitability Model. Dimensions are a way of segmenting and organizing variables. As an illustration, consider customer support. You can segment support calls or incidents by the *type* of problem the customer is calling about and by the *amount of time* it takes to resolve the issue. This segmentation is illustrated in Figure 10, which displays a small part of the Dimensions section of the "Labels Worksheet". It shows how the variable "Support Calls" is aggregated in the Model along the dimensions of **Call Length** and **Call Types**. The result is a matrix (actually a cube, if you include the dimension of time—as in number of calls per period), in which support calls are broken out by call type and call length.

Figure 10: Bottom (Dimensions) Portion of the “Labels Worksheet”

Dimension (item)	Display Item As	Total As	Level As	Comment
Call_Length	Call Length	Total	Call_Length	Buckets into which support calls are sorted by the amount of staff time required to resolve the issue
Short	Short		Call_Length	
Mid	Mid			
Long	Long			
Solution	Solution			
Call_Types	Call Types	Total	Call_Types	
Installation	Installation		Call_Type	
Maintenance	Maintenance			
Cogs_Types	Cogs Types	Total	Cogs Types	A list of the types of cost of goods that are separately tracked in the analysis
Direct_Material	Direct Material		Cost_Factors	
Direct_Labor	Direct Labor			
Overhead	Overhead			

The type and duration dimensions shown in Figure 10 partition the variable Support Calls into segments and at the same time arrange those segments into a hierarchy that can be rolled up to various levels. If looking at the Variables portion of the “Labels Worksheet” is the best way to get an overview of the Model’s variables and what they mean, examining the Dimensions portion of the “Labels Worksheet” is the best way to get an overview of how those variables are conceptually organized.

3 How to Enter and Edit Data in the Product Profitability Template

The Product Profitability Template allows you to enter your own data into the Model in order to further tailor the Model to your requirements or simply to adapt it to changing circumstances. In order to minimize confusion (so you don’t have to spend hours searching the entire workbook to find a particular cell), the template allows you to enter data in two worksheets only: "Inputs" and "Labels". In all cases, the cells that allow data entry are shaded blue, as shown in the collapsed view of the "Inputs Worksheet" shown in Figure 11.

Figure 11: "Inputs Worksheet": Collapsed View

1	ABC Corp.			
2	1/1/2009 to 12/31/2011			
3	Input Data			
4				
5	Shaded cells are input cells. You can enter data in them.			
6	Excel formulas in shaded cells are starting suggestions. You can overwrite them.			
7	Company Name			ABC Corp.
8				
9				
+ 10	Sales			
34				
+ 35	Cost of Goods			
77				
+ 78	Royalties Paid			
102				
+ 103	Marketing Expense			
137				
+ 138	Engineering Expense			
183				
+ 184	Customer Support Expense			
222				

You can enter (or override) data in the cell showing the Company Name. You could change ABC to Acme, for instance.

3.1 How to Enter Data in the “Inputs Worksheet”: Data Entry Tips

Figure 11 shows the collapsed view of the “Inputs Worksheet”, which lists the categories of Input Data. These Input categories correspond to the various categories of reports generated by the Product Profitability Model’s Sub Model worksheets which are accessed through the workbook tabs at the bottom of each worksheet. (See Section 1.3, [The Product Profitability Model Is Made Up of Sub Models](#), for information on these Sub Models.)

Clicking on the "+" sign in the left margin next to a given Input Data category opens up that category, allowing data to be entered for the values of specific variables. Since an Input Data category may contain over 100 rows of data, you need to exercise care in opening these categories, as it is easy to be overwhelmed by information. In general you should only open one category at a time.

When you open a category, you will see a list of subcategories that can also be opened as shown in Figure 12 for the “Engineering” Input Data Category.

Figure 12: “Inputs Worksheet”: Engineering Input Data Subcategories

	7	Company Name	ABC Corp.
	8		
	9		
+	10	Sales	
	34		
+	35	Cost of Goods	
	77		
+	78	Royalties Paid	
	102		
+	103	Marketing Expense	
	137		
-	138	Engineering Expense	
	139		
+	140	Employment Expense	
+	167	Engineering Programs Expense	
+	177	Engineering OH Expense	
	182		
	183		
+	184	Customer Support Expense	

Clicking on the “+” sign next to a particular subcategory opens up that subcategory, as shown in Figure 13 for the “Employment Expense” subcategory in Engineering Expense.

Figure 13: Engineering Employment Expense Input Data Subcategory

138	Engineering Expense							
139								
140	Employment Expense							
141								
142						2009	Q3 2009	Q4 2009
143	Eng Labor Alloc	Hardware	Senior	Product A	13.0	13.0	13.0	13.0
144				Product B	11.0	11.0	11.0	11.0
145				Product C	4.0	4.0	4.0	4.0
146			Junior	Product A	32.0	32.0	32.0	32.0
147				Product B	19.0	19.0	19.0	19.0
148				Product C	7.0	7.0	7.0	7.0
149	Software	Senior		Product A	2.0	2.0	2.0	2.0
150				Product B	1.0	1.0	1.0	1.0
151				Product C	5.0	5.0	5.0	5.0
152			Junior	Product A	3.0	3.0	3.0	3.0
153				Product B	2.0	2.0	2.0	2.0
154				Product C	6.0	6.0	6.0	6.0
155								
156	Eng Wages/Head (Yr)	Hardware	Senior		\$105,000	\$105,650	\$106,304	\$106,963
157				Junior		\$85,000	\$85,526	\$86,056
158		Software	Senior		\$110,000	\$110,681	\$111,367	\$112,056
159				Junior		\$90,000	\$90,557	\$91,118
160								
161	Wage Growth % (Yr)	Senior			2.5%	2.5%	2.5%	2.5%
162		Junior			2.5%	2.5%	2.5%	2.5%
163								
164	Labor OH %				40.0%	40.0%	40.0%	40.0%
165								
166								
167	Engineering Programs Expense							
177	Engineering OH Expense							

Figure 13 shows the Input Data for Engineering Employment Expense broken out along the dimensions of engineering team and job level.

- ✓ **Note:** Most of the Input Categories break out Input Data along various dimensions. See Section 2.3.3, *How to Use the Labels Worksheet to Understand Variables and Dimensions in the Model*, for an explanation of the concept of dimensions. See the bottom portion of the “Labels Worksheet” for a listing of the dimensions used in the model.

In general, you don't have to enter data in input cells that *already* contain Excel formulas, because the template computes default (calculated) values for these cells. You just enter your own values in cells when you want to *change things going forward* and the model will automatically propagate the changes. You don't have to change every cell.

If you want to vary the growth rate, you simply input a new value in the time period when you want the rate to change. For the variable “Wage Growth %Yr,” you could change the “2.5” value to 3 in the second period, and the new growth rate would propagate forward from that period engineering wages would change accordingly.

Bear in mind that these tips are recommendations only. If you want to, you can manually input what you think are appropriate product unit volumes for each period.

3.2 How to Edit Display Names, Comments, and the Model Start Date in the “Labels Worksheet”

You can change or edit the contents of any of the shaded cells in the “Labels Worksheet” to facilitate the overall readability of the Model’s worksheets and enhance the understandability and accessibility of the Model and its reports.

- You can change the display name of any variable, dimension or dimension item: These changes will propagate throughout the workbook automatically.
- You can change the model start date located at the top of the worksheet. The new start date propagates throughout the model, including formulas and date labels. This feature greatly extends the useful life of your template.
- ✓ **Note:** We recommend that you change the model start date by a whole number of the largest time periods in your model. For example, if the basic time grain of your model is quarters, then change the model start date by a whole number of quarters. If your model contains annual sums, then change the model start date by a whole number of years, so the annual sums continue to function correctly.
- You can change the text of a comment associated with any variable or dimension. These new changes will NOT propagate through the workbook, so the "floating" Excel Comments in the worksheets will remain the same as before, because Excel provides no means change the comments automatically. HOWEVER, you can submit the edited "Labels Worksheet" to ModelSheet and receive a new template in which the altered comments ARE reflected in the Excel Comments. (The changes in the display names will be reflected in the new template as well.)

Some examples:

- *Changing a variable display name:* Consider the variable display name "Eng Wages/Head (Yr)", which refers to the average wages per engineering headcount as shown in Figure 13. You might want to change the display name to "Yearly Eng Wages per Head" to make the meaning more apparent, as shown in Figure 14 for that variable's entry in the Labels worksheet.

Figure 14: "Labels Worksheet": Variable Display Label Change

Eng_Wages_per_Head_Yr	Yearly Eng Wages per Head	Average wages per allocated engineering headcount, segmented by engineering team, by time period
-----------------------	---------------------------	--

Result: The display name changes throughout the workbook, as is shown in Figure 15 for a portion of the "Engineering Employment Expense Input Data Worksheet".

Figure 15: Engineering Employment Expense Inputs Data-Name Change

156	Yearly Eng Wages per Head	Hardware Senior	\$105,000	\$105,650	\$106,304	\$106,963
157		Junior	\$85,000	\$85,526	\$86,056	\$86,589
158		Software Senior	\$110,000	\$110,681	\$111,367	\$112,056
159		Junior	\$90,000	\$90,557	\$91,118	\$91,682
160						
161	Wage Growth % (Yr)	Senior	2.5%	2.5%	2.5%	2.5%
162		Junior	2.5%	2.5%	2.5%	2.5%
163						
164	Labor OH %		0.0%	40.0%	40.0%	40.0%
165						

- *Changing a dimension display name:* Suppose you decide that the call length dimensional display name "Solution" is ambiguous and change it to "Extra Long" as shown in Figure 16.

Figure 16: "Labels Worksheet": Dimension Display Label Change

Dimension (item)	Display Item As	Comment
Call_Length	Call Length	Buckets into which support calls are sorted by the amount of staff time required to resolve the issue
Short	Short	
Mid	Mid	
Long	Long	
Solution	Extra Long	

Result: The dimension display name changes throughout the workbook, as is shown in Figure 17 for a portion of the "Customer Support Expense Inputs Data Worksheet".

Figure 17: Customer Support Expense Inputs Data Worksheet

184	Customer Support Expense							
185								
186					Q1 2009	Q2 2009	Q3 2009	Q4 2009
187	Support Calls	Product A	Short	Installation	1,025	1,076	1,130	1,187
188				Maintenance	1,011	1,062	1,115	1,170
189			Mid	Installation	670	704	739	776
190				Maintenance	531	558	585	615
191			Long	Installation	247	259	272	286
192				Maintenance	356	374	392	412
193			Extra Long	Installation	98	103	108	113
194				Maintenance	251	264	277	291
195		Product B	Short	Installation	1,155	1,259	1,372	1,496
196				Maintenance	1,845	2,011	2,192	2,389
197			Mid	Installation	502	547	596	650
198				Maintenance	948	1,033	1,126	1,228
199			Long	Installation	57	62	68	74
200				Maintenance	264	288	314	342
201			Extra Long	Installation	0	0	0	0
202				Maintenance	0	0	0	0
203		Product C	Short	Installation	105	106	107	108

- Changing a variable display name to more closely match the variable formula name: Often, you might want to change the display name of a variable to more closely resemble its formula name. For example, you might change the display name “Fixed Cost of Goods” to “Cost of Goods—Fixed” in order to more closely match the formula name “Cost_of_Goods_Fixed”. The rationale for the change is simple: provided the sacrifice in readability and intuitiveness is small, the greater the congruence between the display and the formula names, the easier it is to understand the model. It is easier to locate formulas on the Formula Worksheet and far easier to understand how the variables relate to and interact with each other.

Being able to change the display names in one place and have the changes propagate throughout the Model is a very useful and desirable capability because it facilitates and enhances the understandability and usability of the model.

3.3 Note on Times to Open Excel Workbooks

The first time you open a large Excel workbook generated by ModelSheet, it may take a few minutes. If you save the workbook in the native file format for your version of Excel (xls for Excel 2003,xlsx for Excel 2007 and 2010), then the second time you open it, it usually opens much faster.

3.4 Note on Excel Error Codes in Templates without Data

New Excel templates with blank or zero input values often display Excel error codes in some cells that are due to the blank or zero values in input cells. Entering reasonable nonzero data into the template input cells will usually make these error codes disappear. If you have entered reasonable data into your template, and the Excel error codes persist, then there could be a problem with your input data, or you may have encountered a bug in the template. If this occurs, please check your data for obvious problem; if the problem persists, please contact us at customerservice@modelsheetsoft.com.

4 License Terms

You may use this Model(s) or Template(s) and any derivative works in the work of your firm, employer and one client or associate. You may not use, sell or transfer the Model(s) or Template(s) for the operation or analysis of an organization that is not your firm, your client or your employer or your associates. For a full description of License terms, see the license agreement on our website at:

<http://templates.modelsheetsoft.com/ModelSheetTemplates/template-end-user-license-agreement.pdf.aspx>

Please address queries to: customerservice@modelsheetsoft.com

Copyright © 2010 ModelSheet Software, LLC

ModelSheet and the ModelSheet logo are registered trademarks of ModelSheet Software, LLC.

Please visit our website at: <http://www.modelsheetsoft.com> .