**Template for Prototype & Product Costs**

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**Prototype Cost:**

**Product Cost= Material Cost + Labor**

**Material Cost is based on BoM (Bill of Materials) plus 10% for Consumables**

Labor Cost is based on the estimated time to make the product by the team members if all the parts, necessary tools, & logistical support are there.

Cost of labor is assumed as $50 an hour.

As an example, let us assume:

**BoM dollar amount is $500**

**Add 10% for consumables= $50**

**Total Material Cost= $500+$50=$550**

Let’s also assume it will take 20 hours (10 hours each by two team members equals 20 hours) to make the product.

Hence Labor Cost=20 hours times $50 per hour= $1,000

**Hence, Prototype Cost= Total Material Cost (including Consumables) + Labor= $550+$1,000=$1,550**

**Product Cost:**

First assume the number of products we will in year.

Year is assumed to have 50 weeks or 250 days. This allows for two weeks of slack to cover Holidays & maintenance of machines, etc.

For simplicity, we assume that we will make 10K pieces a year or 200 pieces a week. This helps you to decide on the labor you need to make that many pieces a week so that you can annualize the labor.

General rules of labor include

 One Engineer for three Supervisors. Salary for a typical engineer is 80K per year

One Supervisor for every 10 to 12 labors. Salary for a typical Supervisor is $60K per year

Salary for typical labor is $40K per year

Use these simple assumptions, you can estimate labor cost for your production.

However, you need to add 30% over annual salary to cover benefits like medical, sick leave, vacation, retirement benefits, etc.

Let’s take an example.

**Let’s assume, you plan to make 10K products per year for your company.**

You 12 labors and one Supervisor to make 10K products.

Using above example of $500 for BoM.

However, since this number was based on few parts & we need 10K for each parts, we’ll get a volume discount, of say, 30%. As a result, our new material cost will be $350 (70% of $500). Now , we will also add the standard 10% for consumables.

**New material cost for large production volume is $350 + $35 = $385**

For labor cost, we add

Cost of 12 labors ($40K times 12 equals $480K) plus one Supervisor ($60K) totaling $540K

We will add another 30% or $162K to cover benefits for these employees.

So, total labor cost is $702K (=$640K + $162K) per year

If we normalize the total annual labor over 1oK products we are making, we get

**Labor Cost per Unit Product = $702K / 10K = $70.2 per part**

**Total Manufacturing Cost = Material Cost ($385) + Labor Cost ($70.2) = $455.2**

However, to cover rent/lease, utilities, machine depreciation, investment, etc. we need to add another 30% 0ver this product cost that includes both materials and annualized labor cost.

In our case, the Overhead Cost is 30% of $455.2 or $136.56.

By adding Overhead to Product Cost we get what is called Product Cost.

**Product Cost = Manufacturing Cost + Overhead**

So, **our Product Cost is $455.2 + $136.56 = $591.76**

**Our Product Cost (rounded to) equals $600**

Now we need to add Profit to our Product Cost to decide the Sales Price for our Product.

Profit Margin depends on Product Type and Product Volume.

It may typically vary anywhere from 30% (High Volume) to 100% (Low Volume) or more.

We assume 30% is our Profit Margin for this Product and typically round it to a nice number.

USING 30% Profit Margin for our Product our Sales Price is $600 plus $180 (30% of $500) equals $780

Rounded Sales Price for our Product is $800 (Rounded from $780)

However, this price is for Wholesales Distributors AND Not the Retail Price!

**So, the Distributor’s Price for our Product is $800**

**Please Note that we have not added other critical costs like Marketing, Yield (there will be Rejects in Production Floor!), S&H (Shipping & Handling), etc. This is actually a simplified model to give a flavor of developing a simple Cost Model**

Now Distributor will also make Money to pay his bills, Let’s assume that he will add another50% to his cost. His profit margin might be higher than manufacturer’s since his sales volume is lower.

In any case, if Distributor adds a 50% Profit to his cost, the end customer will pay the Retail Price set as Distributor’s Cost ($800) + Distributors’ Profit Margin (50% equaling $400) equals $1,200

**Retail Price = Distributor’s Cost + Distributor’s Profit Margin**

**In our case Retail Price comes as $1,200**

**Here is another number of interest, namely, Revenue for the company.**

**Revenue = Product Volume \* Distributor Cost**

**In our case, Revenue for our Company = 10K \* $800 = $8 Million**

**Here are the Key Numbers I am interested in following numbers:**

* **Prototype Cost**
* **Retail Cost**
* **Competitive Cost**
* **QFD Cost (as predicted)**
* **Revenue for the Company**

**If there is any significant difference between these Costs (Retail and QFD, in particular), you must explain them clearly.**