

# CALCULATING OVERHEAD AND PRICE

**A**lan Hauff, pricing expert and small business specialist for University Outreach and Extension at the University of Missouri-St. Louis, has devised a seven-step process for calculating the all-important overhead percentage, which is shown in Fig. I-I on the following page. After the overhead percentage is determined, important pricing decisions can be made.

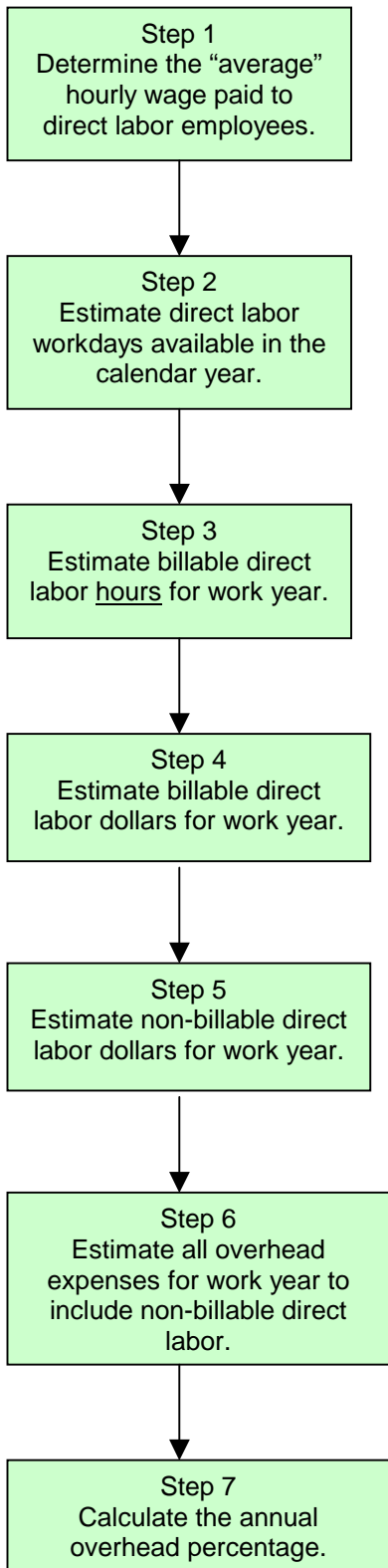
To calculate overhead percentage, several terms must be defined. These are found in Table I-I. For instance, an overhead percentage of 220% means that for every \$1.00 of direct labor billed to the customer, the business must collect an additional \$2.20 ( $\$1.00 \times 220\%$ ) from that customer just to cover its cost of doing business. Thus, if a job required a direct labor wage of \$8.50 per man-hour, overhead of \$18.70 ( $\$8.50 \times 220\%$ ) must be added, thus totaling a direct labor cost of \$27.20 per man-hour. It is at this point that many business owners are shocked to discover the large difference between the total direct labor wage and the direct labor cost.

TABLE I-I. PRICING-RELATED TERMS.

TERM	DEFINITION
<b>Business Expenses</b>	<u>All expenses</u> found on the company's income statement (also known as the profit and loss statement).
<b>Overhead Expenses</b>	All costs found on the income statement <u>except</u> for direct labor, direct materials, and costs attributable to outside subcontractors that can be billed directly to a customer's account. Overhead expenses are absorbed by the business and factored into the selling price as a percentage of the direct labor cost. They include indirect costs such as accounting, advertising, depreciation, indirect labor, insurance, interest, legal fees, rent, repairs, supplies, taxes, telephone, travel, and utilities.
<b>Direct Labor</b>	Labor used to produce products and services purchased by customers. These man-hours are directly attributable to customer activity.
<b>Indirect Labor</b>	Labor used to provide supporting services to the business such as accounting, clerical, custodial, customer services, management, purchasing, sales, and warehousing. These man-hours support business functions that are <u>not</u> directly chargeable to the customer.
<b>Direct Materials</b>	Materials used in the final product or service purchased by customers. These materials are charged directly to the customer's account.
<b>Overhead Percentage</b>	Ratio between direct labor and overhead expenses. This percentage is used to allocate overhead expenses proportionately to direct labor dollars billed to customers.

*Source:* Mildred S Pozner and Catherine M. Frank, *Industry at a Glance Report: Manufacturing Job Shops*, University of Missouri-Rolla, SBRI Center, 1999, 80-82.

**FIG. I-I. PROCESS FOR CALCULATING OVERHEAD PERCENTAGE,**



1. Classify each employee's contribution, or portion thereof, as either direct or indirect labor. Determine the hourly wage rate paid to each direct labor employee and include the business owner, if applicable. Total the hourly wage rates and divide by the number of people counted.

2. Calculate the number of direct labor workdays in a calendar year by subtracting the average number of days that direct labor employees will not be present for work because of weekends, holidays, vacations, and miscellaneous (injury, personal illness, etc.). Count only direct labor employees. Do not include any indirect labor employees in the estimate.

3. Multiply available direct labor workdays by the scheduled 8-hour workday minus the average number of daily non-billable direct labor hours. Non-billable direct labor hours include lunches, breaks, company meetings, training, cleanup, etc., that a customer will not be charged for directly.

4. Multiply billable direct labor hours by average direct labor wage.

5. Subtract billable hours from the total man-hours available in a work year, which is 2088 hours. The remainder equals the non-billable direct labor hours. Multiply this number by the average direct labor rate to arrive at the non-billable direct labor dollars. Non-billable direct labor dollars are absorbed by the company and must be passed on to the customer through the overhead percentage.

6. Refer to the actual or pro forma income statement and total all the business expenses shown for the year. Deduct the cost of billable direct labor, direct materials, and costs attributable to outside subcontractors that will be billed directly to a customer's account. Do not deduct the cost of non-billable direct labor. Adjust the overhead expenses for yearly inflation and projected price changes by multiplying the total by the anticipated percentage increase.

7. Divide the yearly overhead expenses (step 6) by the yearly billable direct labor dollars (step 4), and convert this ratio to a percentage.

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Job shop owners are often shocked to learn the magnitude of their overhead, but including overhead in the prices a firm charges for its products and services is essential for the firm's survival and profitability. After the overhead percentage has been calculated, a business owner can examine the possibilities for making changes in the business that will yield desired results, such as lowering overhead in targeted areas, raising prices, decreasing production times, etc.

### **Pricing Services**

To calculate the price for a job shop service, the firm must set the desired percentage gross margin on selling price. (Gross margin on selling price is the preferred method for adding profit to a product or service because it matches the reporting done in income statements where sales revenue is recorded.) Thus, the price a shop should sell its services for is calculated by:

$$\begin{array}{r} \text{Avg. Direct Labor Rate (in \$/man-hour; from Step 1)} \\ + \frac{\text{Overhead Rate}}{\text{Direct Labor Cost}} \quad (\text{Avg. Direct Labor Rate} \times \text{Overhead \% [Step 7]; in \$/man-hour}) \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad (\text{in \$/man-hour}) \end{array}$$

For a desired gross margin on selling price of x%, convert x% to a decimal and calculate the price:

$$\text{Direct Labor Cost} \div (100 - x) = \text{Charging Rate per man-hour}$$

*Example:*

Smith's Welding Shop has determined its average direct labor rate to be \$15.00/man-hour. It has calculated that its overhead percentage is 200%. It now wants to make a 15% gross margin on selling price. The price Smith's Welding Shop must charge for its services is found by:

$$\begin{array}{r} \$15.00/\text{man-hour} \quad \text{Avg. Direct Labor Rate} \\ + \underline{\$30.00/\text{man-hour}} \quad \text{Avg. Direct Labor Rate} \times \text{Overhead Percentage} \\ \$45.00/\text{man-hour} \quad \text{Direct Labor Cost} \end{array}$$

For a 15% gross margin on selling price,

$$\$45.00 \div (.85) = \$52.95/\text{man-hour}$$

Smith's Welding Shop must ask \$52.95 per man-hour for its services to make the desired profit margin.

### **Pricing Products**

A similar method to pricing services is used to establish product prices. Calculate the cost of producing one item or unit and use the gross margin on selling price method shown in the service example above to find selling price.

*Example:*

If Smith's Welding Shop makes and sells a specific type of widget in addition to providing services, it would need to find the cost of producing one widget before it could set a price for the product. Both direct material costs and direct labor costs must be included in the price calculations. If production time for one widget is 10 minutes and each widget uses \$0.84 in materials:

$$\$45.00/\text{man-hour} \div 60 \text{ minutes} = \$0.75/\text{minute}$$

$$\begin{array}{r} \$0.75/\text{minute} \times 10 \text{ minutes/widget} = \$7.50 \quad \text{direct labor cost per widget} \\ + \underline{\$0.84} \quad \text{direct material costs per widget} \\ \$8.34 \quad \text{cost to produce one widget} \end{array}$$

For a 15% gross margin on selling price,

$$\$8.34 \div (.85) = \$9.82 \text{ selling price for each widget}$$


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