



Financial Principles of Project Management

An Online Continuing Education Course for Engineers

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Financial Principles of Project Management

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Introduction

To complete a project successfully, a Project Manager should be able to deliver contracted services to a client within the agreed-upon stipulated price, while preserving, protecting and even improving on the estimated profit. In keeping with sound business practice, the techniques discussed in this course are predicated on maintaining credibility with your clients and establishing long-term, profitable relationships.

A business is successful when it generates a profit, which means that its income exceeds its expenses. This course examines, from a contractor or consultant's perspective, the concepts and skills needed to develop realistic cost estimates for proposed services in order to cover costs and make a reasonable profit.

It is apparent, therefore, that in order to separate cost from profit you should be able to calculate your actual cost of doing business with some degree of accuracy. The amount of profit you can realize depends on a number of factors that are most often tied to market conditions, the nature of your competition and your costs. The various types of contracts commonly used by clients also affect your potential profit and financial exposure. Therefore, this course is divided into three sections. The basic principles followed in the calculation of costs and billing rates are presented in the first section. The second section reviews the most common contract types, the advantages and disadvantages associated with each type, billing rate computations and the potential pitfalls and financial exposure for each. Finally, the third section presents a case history which highlights how seemingly minor unforeseen events near the start of a project can severely impact profitability if the Project Manager is not attentive, proactive, and willing to engage and communicate with the client.

Development of Services Cost Estimates

For any company in the business of selling services, be they engineering designers, constructors, landscape architects, architectural planners, surveyors or a host of other enterprises, the fundamental product that is being sold is time. The time that technical staff spends performing a task or activity for a client is billed to that client in accordance with accepted accounting principles and pre-determined agreements reached between client and contractor.

Corporate management time, on the other hand, is typically not billed directly to clients, and is considered an overhead cost of the company. Overhead costs are recovered indirectly. These operational expenses are spread out and added as a fractional adjustment to each and every invoice issued by the company, as explained in later sections of this course. Between the Corporate Management and the technical staff, a middle layer of Project Managers and Discipline Leaders is generally considered partially billable and partially overhead. The following organization chart is color coded to distinguish between the staff functions that are classified as pure overhead, mixed functions, and those hopefully one hundred percent billable components of the company.

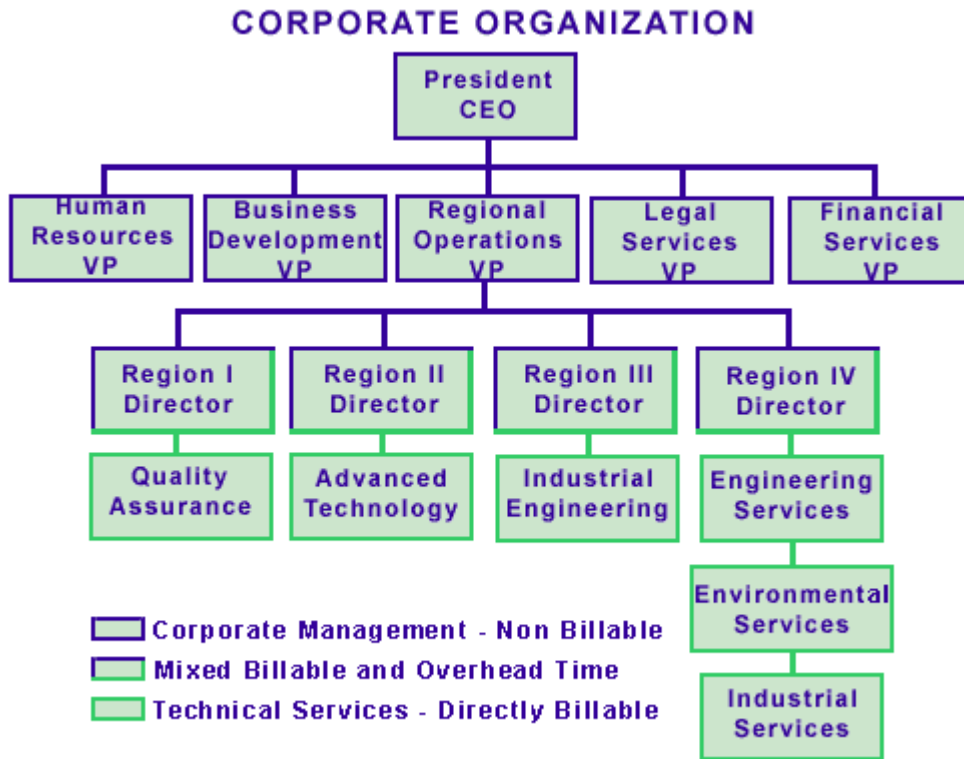


Figure 1: Example of a corporate organization chart that differentiates between the staff functions that are considered overhead versus those that are directly billable to clients.

Therefore, a pertinent question for this course is: how are the activities of all the staff in a corporation converted into dollars and cents to calculate the cost of delivering services to clients? A business is successful when it generates a profit, which means that its income exceeds its expenses.

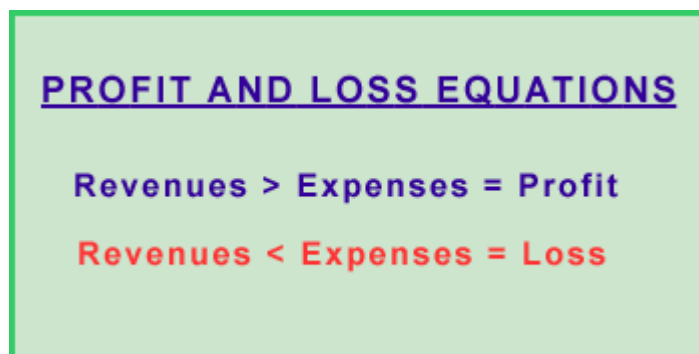


Figure 2: The difference between realizing a profit and incurring a loss depends to a great extent on the accurate estimation of expenses or services costs.

In order to estimate its amount of profit, the company must be able to identify and recover its cost to deliver services to clients. Profit can then be calculated by subtracting cost from revenue.

The pressure to develop accurate cost estimates is driven by market conditions and competition. It is common practice for clients to award contracts based not only on the merit of the technical scope of work but also, and in many cases most importantly, on the overall costs associated with the delivery of services. In order to underbid the competition, and not lose money, a Project Manager needs to have a firm grip on the elements of the proposed budget in order to know, with a high level of confidence, what can and cannot be traded in negotiation with the client.

Regular Time Cost

The basic assumption in calculating a regular time cost rate is that a company has to recover its staff salary expenses based on actual workdays in a year. The number of workdays in a calendar year is calculated as follows:

<u>Time Breakdown</u>	<u>Days</u>	<u>Hours</u>
Calendar days in a year	365	2,920
Calendar weekend days (Saturdays and Sundays)	(105)	(840)
Available Workdays (Calendar days less week ends)	260	2,080
Company Holidays (may vary by employer)	(10)	(80)
Net Available workdays per year	250	2,000
Annual Vacation days (assumed)	(15)	(120)
Absences (such as sick leave, assumed)	(7)	(56)
Actual Available workdays per year	228	1,824

Based on this analysis, employees are paid for 260 days of work (2,080 hours) per year, but may be billable for a maximum of 228 workdays (1,824 hours) per year.

However, for the calculation of billing rates, salary cost is initially computed using the net available workdays (250), prior to the deduction for vacation and absences. For example, the salary cost for a staff member who earns \$50,000/year is calculated as follows:

$$\$50,000 / 250 = \$200/\text{day}$$

Note that the rate of \$200/day does not include an adjustment for Vacation and Absences (V&A). This allowance is usually applied by using a multiplier calculated as follows:

V&A multiplier is: $(22 / 228) + 1 = 1.09649$

Therefore, the adjusted regular time cost rate/day = $\$200 * 1.09649 = \219.30

The example given above assumes 15 vacation days and 7 sick days, for a total of 22 days per year.

The vacation and absences (V&A) adjustment is applied by a multiplier to permit individual adjustments to be made on a case by case basis. For example, in many companies the amount of annual vacation increases with length of service and the V&A allowance can be adjusted accordingly. For example, if an employee has an annual vacation of 20 days, the calculation is adjusted as follows:

$(27/223) + 1 = 1.12107$

The equivalent adjusted regular time cost rate/day = $\$200 * 1.12107 = \224.22

Salary Related Costs

Salary related costs comprise the benefit package offered by the company to its employees. Actual salary related costs for the billable staff is calculated as a percent amount of the annual salary and added to the calculated regular time cost. Some of these costs are government mandated while others are discretionary. Examples of such costs are listed in the following figure:

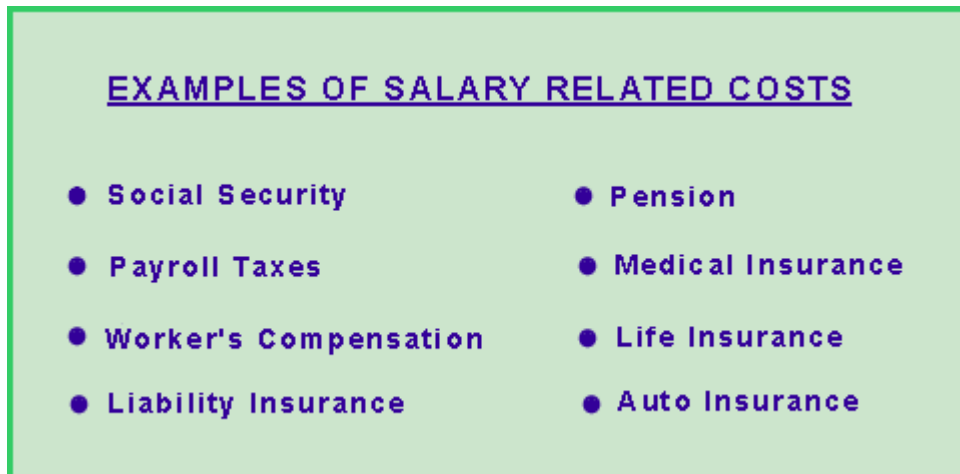


Figure 3: Examples of salary related costs that are considered part of the employee benefit package

For example, if the benefit package of our \$50,000/year employee is worth \$12,000 (24%), the adjustment to his regular time cost rate/day is calculated as follows:

$\$219.30 * 1.24 = \271.93 assuming 15 days of annual vacation, or

$\$224.22 * 1.24 = \278.03 assuming 20 days of annual vacation

Note that for the same base salary, the adjusted regular time cost is related to the length of the employee's annual vacation.

Overtime Cost

In calculating this cost, you need to consider three types of overtime:

- **Regular Overtime:** for work performed over the standard 8hours/day. The hourly rate for regular overtime is the same as the employee's regular hourly rate.
- **Premium Time:** for work performed on Saturdays and holidays. Premium time is generally paid at 1.5 times the employee's standard rate.
- **Double Time:** for work performed on Sundays and major holidays, paid at double the normal salary rate.

Many companies have specific guidelines that restrict Exempt Employees to receiving regular overtime compensation only, irrespective of when that overtime is worked. The term "Exempt Employees" refers to the highly compensated technical staff employed by the company on a full time basis with a full benefit package. Temporary employees and hourly workers, however, usually qualify for premium time and double time compensation. A company may also decide under certain circumstances to qualify certain categories of employees to receive premium time compensation. For example, a company may decide to pay its Civil Design Engineers that work on certain projects in remote areas premium time compensation for work exceeding say 45 hours/week. Usually officers, department heads and other top management personnel are not eligible for overtime compensation.

The Regular Overtime rate is the same as the regular salary rate and is calculated as follows:

$$\begin{aligned}(\text{Annual Salary} / 250 \text{ days}) &= \text{daily cost rate} \\(\text{Annual Salary} / 2000 \text{ hours}) &= \text{hourly cost rate}\end{aligned}$$

The Premium time rate, which is 1.5 the regular salary rate is calculated as follows:

$$\begin{aligned}1.5 * (\text{Annual Salary} / 250 \text{ days}) &= \text{premium daily cost rate} \\1.5 * (\text{Annual Salary} / 2000 \text{ hours}) &= \text{premium hourly cost rate}\end{aligned}$$

The Double time, which is double the regular salary rate is calculated as follows:

$$\begin{aligned}2.0 * (\text{Annual Salary} / 250 \text{ days}) &= \text{double daily cost rate} \\2.0 * (\text{Annual Salary} / 2000 \text{ hours}) &= \text{double hourly cost rate}\end{aligned}$$

Note that in calculating the overtime component of cost, the vacation and absences and other salary related adjustments are omitted, because they have already been applied once in the calculation of the regular time cost. Notwithstanding this principle, many companies do not make a downward adjustment to their overtime cost and end up making extra profit from the overtime labor of their staff. The risk you run is that this practice may be discovered and disallowed during a financial audit. Also,

using this practice will result in the calculation of higher estimates for services cost which may likely keep your bid out of the competitive range.

Overhead Costs

Large companies group their staff into pools of technical resources that provide specialized services. Overhead pools are comprised of organizational departments or may represent a division of the company. For example, pool No. 1 may provide engineering services, while pool No. 2 may provide environmental services, pool No. 3 risk management services, and pool No. 4 quality assurance services, etc. In some companies the total number of pools can be quite large. The overhead cost of operating each pool within the company is usually calculated separately. In other words, each pool will have a different overhead multiplier. Overhead costs for each pool are calculated based on:

- Salary costs
- Non-salary costs
- Administrative costs

The following figure lists the types of overhead expenses under each of the categories listed above.

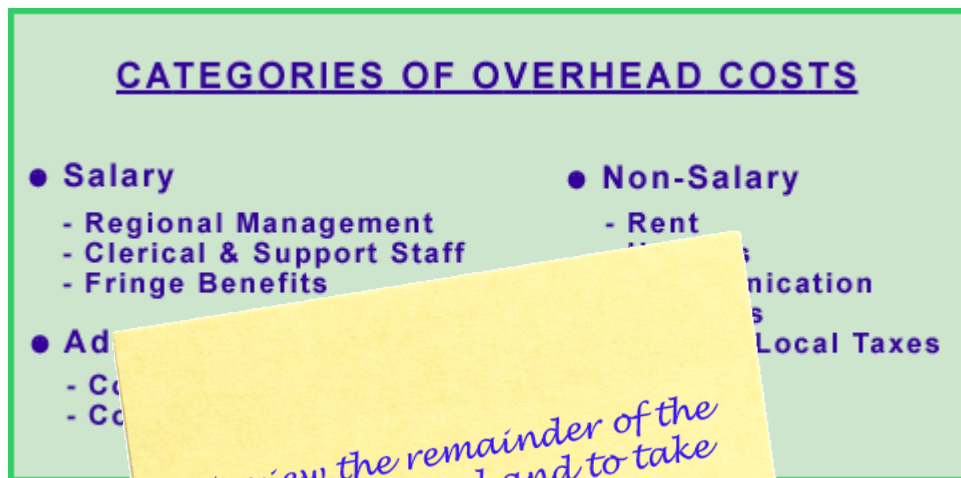


Figure 4:

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Overhead salary expense: support staff salaries that facilities costs such as rent development. The general management to the pool.

the clerical and other nses consist of actual research and business portion of corporate

Overhead is continuously a average that reflects existin Overhead is applied as a m

a quarterly running services are performed. may vary among the various pools of