ROI Labor Rate Calculation

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How much does a company really gain for each hour of labor saved through automation? The answer is important because this is a key input when calculating the financial return on an automation project. Some people like to use the employee's hourly pay rate. Others suggest using the fully loaded or fully burdened rate. The fact is that using either of these rates could result in a skewed evaluation. So what rate should the savvy Manager use?

It seems natural to assume that if a factory worker is making $15/hr that every hour saved would result in a savings of $15 to the company. The problem with this thinking is that the Employers actual cost per hour is much higher than this due to payroll taxes, fringe benefits, etc. If this rate is used in an investment evaluation, the expected savings would be underestimated and the evaluating manager would miss an opportunity to save his/her company money. The most common hourly rate used today is what is called the fully loaded or burdened labor rate. Equipment suppliers rarely correct this thinking because it makes projects easier to justify. However, unless a company's overhead structure changes as a result of a project, this rate swings the evaluation pendulum too far in the opposite direction as we will see below.

Let's dig into what is included in the fully burdened labor rate. Nearly every company has some fixed "costs of doing business." These costs include: rent, insurance, water, lights, heat, etc. Though not directly attributable to producing products, these costs are very real and must be included in a company's cost of goods sold. The common technique for capturing these costs is to allocate them across the total number of labor hours that are directly producing product (direct labor). This exercise results in a burden or overhead rate that is commonly expressed as a percentage of labor cost or in dollars per hour. Rates vary depending on the companies' fixed costs and total labor hours but rates are commonly in the area of 250% or $37.50/hr. So, a typical fully loaded hourly rate would include the employee's compensation + payroll taxes + fringe benefits + overhead or burden rate and look something like the following:

$15/hr + $37.50/hr = $52.50/hr $15/hr + ($15 x 250%) = $52.50/hr

The result is a labor rate that accurately reflects a company's overall cost for each hour of production. So then why wouldn't a sensible person use this rate to evaluate an automation project? The reason is because a company's fixed overhead costs will not necessarily go away as a result of a given automation project. If these overhead costs are considered savings when in fact they are not truly eliminated, the expected return on an automation project would be over estimated.

If the overhead portion or allocation is eliminated from the fully loaded rate, one is left with what is commonly called the variable labor rate. It is called the "variable" rate since it reflects the incremental or marginal cost of adding or subtracting an hour within an

organization regardless of its overhead cost structure. At a high level, the variable labor rate is calculated as follows: employee's compensation + payroll taxes + fringe benefits. Many accounting departments calculate this rate as part of their financial plan but if not it can be estimated as outlined below.

Most managers will not have any trouble coming up with an employee's base compensation so one can move along to estimating payroll taxes and fringe benefits. Payroll taxes include the employer portion of Medicare and Social Security and are currently about 6.75% of the base labor rate. Fringe benefits get a little more difficult to estimate as they vary from company to company but commonly include the employer portions of: retirement plan contributions, medical/dental/disability insurance premiums, vacation/holiday/sick pay, unemployment insurance and workmens compensation. Below is an example for a typical manufacturing worker.

Base Labor rate	$15.00/hr
Retirement plan matching (8%)	$ 1.20/hr
Payroll Taxes (6.75%)	$ 1.00/hr
Vacation, Holiday & Sick Pay (15 days)	$ .90/hr
Health insurance premiums	$ 4.00/hr
Unemployment Insurance (1%)	$ .15/hr
Workmens compensation	$ 1.00/hr
Variable Direct Labor Rate (Approximately $48,000/yr)	**$23.25/hr**

Using the variable labor rate will provide the most accurate assessment of an automation project's labor cost savings provided that the overhead cost structure of a company remains constant. A reasonable labor savings estimate is a key component to making sound investment decisions. However, labor savings is only one potential benefit that can be achieved through automation. Savvy managers know they must also consider improvements in safety, quality, capacity, consumables & floor space when making an investment decision. Please visit www.ast-inc.com for future white papers on these subjects and more.