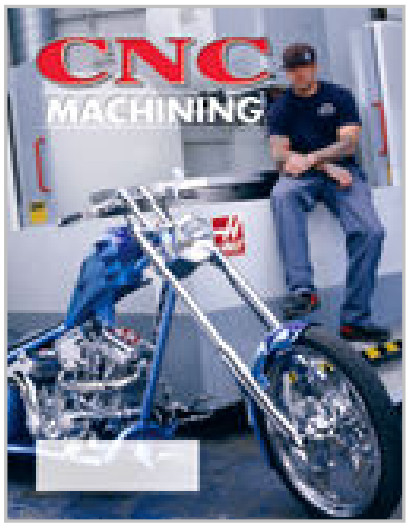

COMPUTER-AIDED ESTIM@TING

Offering a quote isn't as simple as it may appear, and in these competitive times, getting it right could be what keeps you in business.

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Every time you send a quote to a customer, you are betting your business – your profit or loss – on the accuracy of the times in that quote. Figure in too much time and your quote may be too high; figure in too little and your profit goes out the window.

In recent years, computer-aided estimating has come to the fore as a means to take the guesswork out of the quoting process. Unfortunately, the industry has neither a standard definition of what an estimate is, nor standards by which to measure the results an "estimating" program provides. Before selecting a software program for your own estimating, it is important to understand the strategies the software uses to "build" a computer-aided estimate.

What Is Computer-Aided Estimating?

A better question might be: When is a computer-generated price really an estimate? When people talk about estimating software, they typically refer to one of two groups of software:

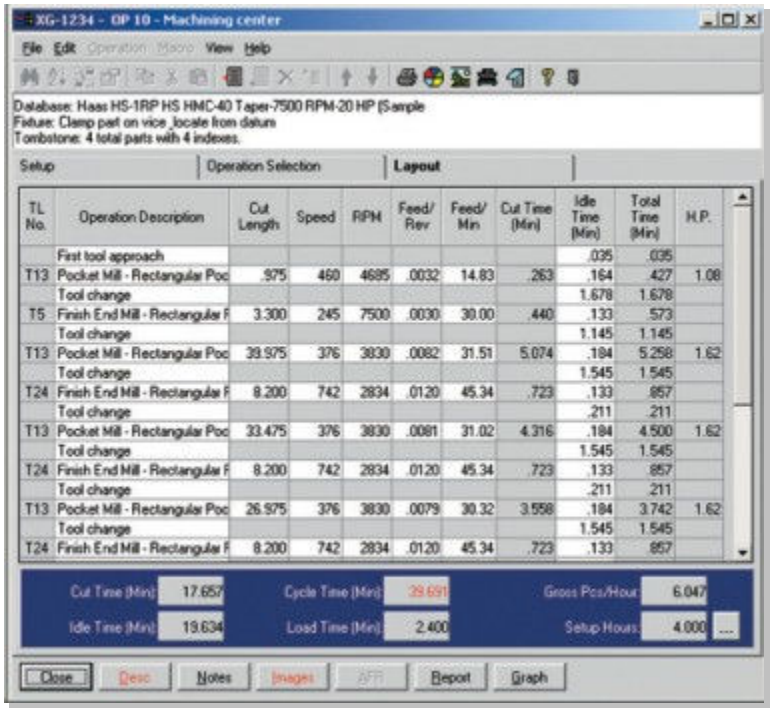
Quoting software simply helps the shop owner determine a price. The estimator manually calculates or guesses the time a job will take.

Estimating software not only provides a quote, it also estimates – using speeds and feeds – the actual time a job will require in the shop.

Time is the factor that differentiates between quoting and estimating software. And time is the overriding factor that determines the accuracy of an estimate, making the difference between profit and loss.

Within the estimating classification, some software systems are standards-based, some are engineering-based, some exhibit genuine intelligence by emulating actual machine

motions, and others are evolving from one form toward another. Intelligent simulation attempts to determine how long each operation really will take, as opposed to how long it should take. And now, automated feature recognition has entered the picture.



Having the capability to account for rapid travel and idle times defines the difference between standards-based, engineering-based and intelligent–simulation estimating systems. The latter system tells you that it **will** take one minute – not that it **should**. Intelligently simulated estimates attempt to include every significant event, as opposed to interpolating average times and indicating what should happen.

The term “estimating” still sounds like a guess, no matter how sophisticated the software is. In fact, some computer-aided estimating software programs are true engineering-based process-planning and profit-predicting systems. Today, just as speed and accuracy are demanded on the shop floor, predicting profit before a job gets to the shop is a critical phase of manufacturing. It begins by computing an accurate price for each job.

The Benefits of New Technology

An exciting change in computer-aided estimating has emerged. Many shops have the capability to receive a request for quote (RFQ) electronically, with an accompanying drawing. The estimating program can automatically recognize the part features and develop a suggested production method for the part. The estimator can review the information, accept or modify the process as needed, and send the customer a price for the part – all in a matter of minutes. The customer can then accept the quote’s cost – having reviewed the e-mailed information – and can reply with a confirming e-mail.

Upon receiving the confirming e-mail, the estimator can electronically forward the information from the estimating system to the shop management system, and to the part programming system for processing on the shop floor. Realize, as well, that this opens up the estimating process to a whole new department that has always asked, “If I make this change, how will it affect the cost of manufacture?”

Now, design engineers using estimating/design tools as described above can make changes to the design, and reprocess the part in the estimating/part recognition system. There, they can see the instant impact of their design changes on part cost.

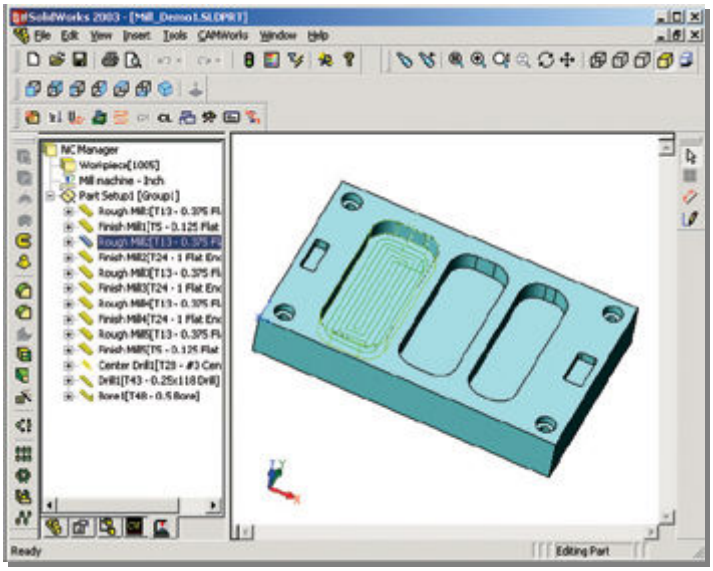
Those who have treated quotes lightly in the past “because it is just an estimate” may find themselves losing the job before they begin their quoting.

Remember, when it comes to estimating, you don’t care that it **should** take one minute – you need to know how long it **will** take. In an estimate simulation, the software attempts to include everything significant that occurs, as opposed to what should happen. The simulation process must factor into its calculations many issues: How many types and styles of machines are used today by shops? How many different vendors? How much time is lost by lead-in and lead-out?

Rather than providing generic standards for turning or drilling, intelligent simulation will recognize perhaps 60 independent machine types for those processes.

What was said earlier bears repeating: When buying estimating software, remember that each time you send a quote to a customer, you are betting your business on the accuracy of the times in the estimate.

Today, most CAD/CAM systems integrate with a solids package or have an internal solids drawing capability. Combined with that capability, feature recognition now is taking part design in a new direction. Solids packages enable feature recognition by other software – no more visualization, no more isometric views.

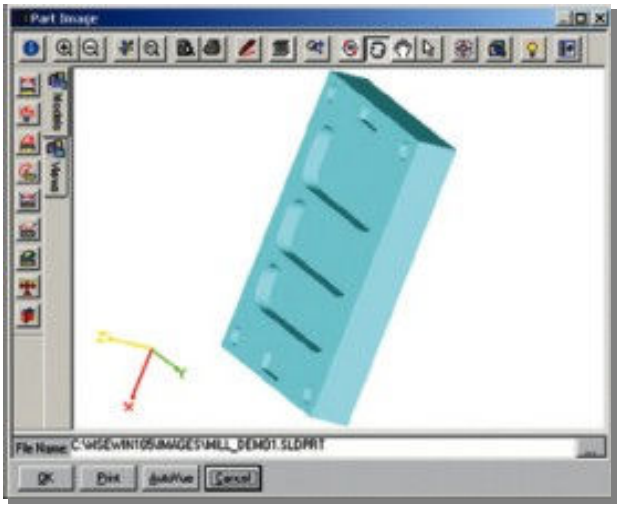


Clusters of software packages that use solids will revolve around a technical database. This supports a consistent method of programming and manufacturing. In that technical database will be relationships of features to manufacturing methods. For example, a database entry for a 1/4"-20 tapped hole, 3/4" deep in 6061-T6 aluminum, may specify that a 0.125" center drill be used to spot the hole prior to drilling, and then a 0.201" diameter drill be used to drill the hole. When you machine a part out of 316 stainless steel with a certain finish, the technical database can suggest that you machine using the specified speeds, feeds and tools that you previously determined are appropriate. Additionally, knowing the material can provide the part weight, the center of gravity, and possibly highlight other challenges that significantly enhance a computer-aided estimating system’s ability to create estimates automatically.

Feature Recognition and Estimating

It won't be long until an estimator – knowing a part was designed in a solids program – will click on a pull-down menu and choose "recognize features." When the software recognizes a "shaft adapter," and the estimator selects the machining center to run the part, the software will suggest a center drill, a drill, a face milling operation, a contour end milling operation and a burnishing operation. That's the set of work instructions based on the features it saw. The estimator will be able to drag and drop and rearrange any tool or process, based upon his knowledge of the facility. Feature recognition in computer-aided estimating is already in the marketplace. It's available for turning and milling, as well as fabrication processes. Consider a simple part, linked from a solids package to estimating, and then to a CAD/CAM system. The identified features from the solids technical database are matched with the estimating program's technical database.

With this data, the estimating program knows which tools to use. By automatically reviewing the machine parameters and the part, the estimator may find that the initially selected machine is unavailable or otherwise not optimal for the job – perhaps it has insufficient tonnage, tolerances or size limitations. Therefore, the estimator – who is always in control – could select another machine.



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