Computerized Estimating: A Technology Whose Time Has Arrived

For Estimation’s George Llewellyn, the computer improves the speed and accuracy of the job calculations while leaving the estimator in full control.

It’s a job that calls for a super teacher.

And in that role, George N. Llewellyn, founder and president of Estimation, Inc., 805-L Barkwood Court, Linthicum Heights, MD, amply fills the bills.

His company is the originator and marketer of the famed Bidmaster computerized estimating system. For the past 16 years, Llewellyn’s company has been convincing specialty contractors to step up to the computer to achieve faster, better, and more accurate estimating.

Despite the demonstrable benefits of computerized estimating, by Llewellyn’s own admission, it’s not been easy. Estimating is an art form near and dear to the heart of any contractor. A change to something so radical as an electronic device for a business operation which represents profit or loss comes grudgingly . . . if at all.

Yet Llewellyn and his marketing people persist—and succeed. They sell and they teach. They revolutionize with the quiet, consistent determination of people who believe fervently in their product and its advantages.

Indeed, a few minutes listening to Llewellyn scatter the misconceptions about computerized estimating like a power surge coursing through a data disk reinforces a distinct impression about estimation: with this company the role of the computer in specialty construction estimating really is a cause. Llewellyn’s cause. As a result, his estimating system is in use by more than 6,500 firms and the total grows daily.

It’s always been that way for the Philadelphia native. He followed up a two-year U.S. Navy hitch during the Korean war by earning an education degree at West Chester State Teachers College. Since then its been systems and specialty construction estimating.

George launched a 17-year career selling programmable calculators and related estimating products to contractors and estimators for the Underwood-Olivetti Corporation. By today’s standards, he was demonstrating and marketing the most rudimentary estimating products, but he was teaching himself what estimating needed.

For a short time he was involved in the development of marketing of a product which assisted certain takeoff functions. Three years later in 1972, when the first truly functional microcomputers came on line, allowing the coupling of the computer with take-off devices to generate data, Llewellyn, now living in Baltimore, knew it was time to make a serious move.

A year later, he had a partner and sufficient venture capital to “. . . conceptually design what we felt the market place needed and would accept.” That his original philosophy was correct is confirmed by more than 6,500 user firms, and the on-going development of an integrated package that provides a user with the computer, value added peripherals, and separate software in such specialties as walls.
and ceilings, electrical, HVAC, mechanical, painting, and concrete.

To support the program, Estimation offers each user with a database, the necessary training to implement the system successfully and ongoing technical support and product enhancement.

To George Llewellyn, computerized estimating is the future. For a contractor to continue to avoid the benefits of electronic assistance brings out all the qualities of the super teacher. These misconceptions, he says firmly, must be addressed because the future for computerized estimating is here—it isn’t around the corner.

**DIMENSIONS:** The major concern for any contractor or estimator when using the computer is how will the system accommodate individual differences. Not every contractor does things the same. How does Estimation’s package respond to this question?

**LLEWELLYN:** When we first started, each installation was customized. It needed to fit the actual business profile of each user.

Over the last 16 years, a slow transition has enabled us to evolve a standard package so comprehensive in its scope that it offers any contractor the flexibility to adapt specifically to the kind of system he wants to set up.

**DIMENSIONS:** You mean the software can now accommodate different estimator approaches, rather than need to change the software?

**LLEWELLYN:** In a manner of speaking, yes. It’s now set up so an individual contractor can figure his labor any way he wants. That means on square foot with manhours or dollars with specific rates for such items as framing, hanging board, trimming and spackle and finish, or simply labor on a manhours or dollars basis with productivity computed by standard size, gage or partition height.

**DIMENSIONS:** The Estimation program is one of the best known names in the specialty construction business. How have you managed to get such deep penetration?

**LLEWELLYN:** Well, our marketing approach is intended to stay close to the specialty contracting industry. It’s our intent to work closely with the related associations, such as AWCI, to help them with seminars, workshops, and educational programs...to publish books on computer estimating.

From this activity we get responses and then follow up with personal sales calls and demonstrations.

**DIMENSIONS:** I take it the Estimation program is primarily for commercial-industrial contractors?

**LLEWELLYN:** Oh, yes. The residential contractor doesn’t generally spend enough time with estimating that he would be a good prospect. Unless a contractor spends at least 10 hours a week in estimating, he probably can’t make effective use of the Estimation package.
In most cases, that’s the real eye opener for contractors who have been holding back. It doesn’t take long to see the advantages of doing their estimating in a faster, more accurate way.

DIMENSIONS: From there, it’s a quick step to training and actual implementation. Is that the usual course?

LLEWELLYN: We have two training centers, one in West Palm Beach, an 8-classroom complex, for contractors east of the Mississippi and the other, for those west of the Mississippi, a slightly smaller one, in the San Francisco area.

The full-time trainers are industry knowledgeable people in their particular specialty. It’s an intensive 4-day session and fully capable of making a non-computer person fully competent with a computer estimating system.

DIMENSIONS: Much of the fear of computerized estimating has been assigned to fear of the computer itself . . . not knowing how to operate the electronic marvels. How many of the contractors who come to your schools have never before been seated in front of a computer?

LLEWELLYN: I think that fear of the computer itself is a major factor. Some 95 percent of the contractors who come to our classes have had no computer experience before.

Believe me, that’s really not a problem. Learning to run the computer is child’s play. To learn how to operate the estimating system is the greater challenge-and we’ve never had a failure. That should place the fear factor in the proper perspective.

DIMENSIONS: Theoretically, the contractor or estimator should then be able to return to his office and automate his estimating. Is that the case?

LLEWELLYN: No, not yet. This is where the customizing phase kicks in. The estimator does know by this time how to operate the hardware and the software, but first he must return
home and dedicate between 40 and 60 hours of work modifying the data base to reflect his own estimating data.

We provide some 60-70 wall assemblies, for example, but a contractor must develop his own additional assemblies and insert prices of materials and labor units. The ultimate benefit makes it well worth the effort.

I wish this could be made easier but it can’t. Unfortunately for the wall and ceiling industry, there’s no established, usable material pricing service such as exists in the electrical or mechanical business.

**DIMENSIONS: How about fallout?** I mean, how about the estimator who attends your school and then returns, for one reason or another, to his old manual technique.

**LLEWELLYN:** There isn’t enough fall-out that it’s a significant factor. But a contractor does have to stay with it. Our training school isn’t the end. The data base work is a reasonable requirement and it’s intended to allow a contractor to customize his data . . . to make the system reflect the way he wants to do his estimating. That’s what contractors want, the ability to customize. Who better to enter this data than the individual who understands it and will be working with it.

Besides, we contact each user after he’s completed the training . . . answer questions, give technical assistance. We do everything we can to get them up and operating.

**DIMENSIONS: What are the major considerations to explain why an estimator wouldn’t leap at the chance to automate his operation? What worries or concerns are you dealing with most of the time?**

**LLEWELLYN:** I think we always deal with two major issues in the contractor’s mind.

First, there is the perception that you lose the feel for the job with computer estimating systems—

**DIMENSIONS: That particular worry has been expressed many times by experienced estimators.**

**LLEWELLYN:** I’m sure it has. Then let me comment on it briefly.

Some feel that doing a takeoff with a probe doesn’t give the estimator the deep involvement with every subtlety of a particular task or construction area.

I don’t think that’s true. The estimator is still going through the job and taking it off. All the probe does is measure accurately while eliminating the time-consuming clerical work that is supplemental to a good takeoff such as posting to all the columns, or measuring the plans by hand.

With a probe you still look at and evaluate the plans as you proceed. You must do that whether you’re doing it manually or with a probe.

**DIMENSIONS: A moment, please? I hear what you are saying, but many estimators contend that by going over and over the plans you develop a feeling ... an intimacy ... a feel for the job that is subjective and that you simply can’t get in a once-over-lightly run with a probe ... however accurate the probe?**

**LLEWELLYN:** I’m sure you’re familiar with the sense of involvement estimators talk about . . . the kind that pops them wide awake in bed at 3 a.m. as some segment of the job abruptly makes sense.

**LLEWELLYN:** I don’t doubt for one minute that going over a plan time and time again brings you closer to it. You do that with a probe, too.

Of more importance, though, is the fact that a computer and probe allows you what I call “thinking time.” Let’s look at this way: if you spend a lot of time writing in your data into the columns on your takeoff sheets, that’s time away from actually studying the plans. That isn’t familiarity time. It’s wasted time.

The computer does all of that with a single key entry. That kind of capability means you can take off a room and then simply call up all the information that’s been entered—and study it . . . evaluate it . . . estimate. Do you want to go back over the labor totals for, say, a lobby. A couple of key strokes will give you all of that information—and you can manipulate it . . . change it . . . alter it . . . make it do what you want.

Furthermore, there’s little chance of anything being left out with a computer. Estimators are human and when they get tired they make clerical errors. A computer doesn’t get tired.

Once the probe has accomplished the takeoff and recorded the data into the computer’s memory, it’s there. No chance for human error or a transcribing mistake.

**DIMENSIONS: You’re pushing hard on the time saving feature, aren’t you?**

**LLEWELLYN:** I think any contractor will concede there are other benefits to a computer for estimating, but, yes, time savings is the major advantage.

By removing the manual tasks, an estimator can focus better on the job itself. He gets rid of clerical tasks and spends his time going through the plans for details and recognizing problems.

The clerical function is an important one in estimating: you must have your numbers precise when it comes to time and materials. But experience, maturity, the ability to locate problems and construction details are incredibly important, too, and that’s what the computer does beautifully; it provides a means for you to inspect accurate data and mentally build the plans you’re studying . . . the estimator’s true function.

**DIMENSIONS: Some estimators are uneasy about the probe itself. They worry about sale problems. That’s not a valid criticism, is it?**

**LLEWELLYN:** Not really. We have a “SCALE” on the keyboard. If the scale is different, you just change the scale and go ahead.

In any event, if you don’t like a probe an alternative is available. Note the computer setup on that table. See the usual hardware setup . . . our special estimator’s keyboard—with a plastic template which is unique to the type of specialty contractor—plus the probe.

Well, another configuration consists of a digitizing tablet, a large current carrying board, about the size of a drafting table, which responds to an electronic pen. You place the plans on the tablet and then simply touch the pen point-to-point to get an accurate measurement.

**DIMENSIONS: You alluded to it earlier, but let’s touch again on the subjective element of a job. How do you answer when an estimator contends it is impossible to convert a subjective discipline like estimating to a bunch of math formulas?**

**LLEWELLYN:** We’re not trying to remove subjectivity: we’re actually improving it. I’ve been hearing the comment for many years that you can’t...
quantify experience and knowledge and I get quite evangelical about it.

Over the years we’ve recognized the main reason for resistance to computer estimating is the concern of a contractor that his estimators won’t be able to apply properly their brains. In other words, how can a computer estimating system possibly relate itself to varying labor conditions?

How could a computer recognize the difficulty of installing a certain assembly in a certain location under certain conditions?

These are legitimate concerns, but they can be addressed. In my judgement, our computer estimating system is designed to provide for a superior method to effectively evaluate labor conditions and to make adjustments.

**DIMENSIONS: Yes, but how—**

**LLEWELLYN:** Upon the completion of the takeoff, all of your data is now in the computer and compiled accurately, right? Well, all those quick commands are ready now to allow you to apply your knowledge and experience, your hunch feelings, your intuitive sense of what is needed.

You’re ready for analysis . . . “think time” and all of our data is in place.

With a quick entry you can summarize the job: with another keypunch you can get a bid summary, you can get extensions, you can get material lists.

You can pick off any individual job area and review it . . . floor, room, wing, lobby . . . you name it. You can tell the computer to summarize the job by each defined location. It’s all there in front of you now . . . a keystroke away. Very easily all your data comes to the screen.

Let’s say the estimator wants to review the framing labor in the lobby area. He can call it up, adjust it anyway he wants.

Remember, he’s got some time now. That’s time to sit and observe . . . evaluate . . . analyze . . . and adjust. He’s using his skill and experience now,
applying judgement calls all the way.

Furthermore, because he’s got his own customized data in memory all the numbers coming up are his.

You can’t ask for much more: a system that allows an estimator to see everything in every defined area so he can evaluate conditions and increase or decrease the labor values.

**DIMENSIONS:** So, rather than learn while performing clerical tasks, you say, get the clerical part over with by automation and then analyze the whole set of data at leisure?

**LLEWELLYN:** Yes, and you can do a lot more accurate estimates that way, too.

Everything’s available now with a keystroke. No more flipping of pages and groping the data.

The call up is virtually instantaneous.

Compare that to a manual approach. In nine out of 10 estimates done manually, we’ve learned that the estimator seldom goes back and sorts the area by locations. He just doesn’t have the time to do all that clerical work and then review it too.

Let’s be honest about it. An estimate really represents “posting” quantities of assemblies. In that environment, a computer shows your data on a screen and you pick what you want. With the probe you measure the amounts, plug in height and stud spacing and the assembly is complete. What could be easier?

How could someone not familiar with computer estimating continue to insist that this can be done better by hand than the instantaneous action of a computer.

Once this entry of quantities has been completed, the estimator is finished with it. A manual system forces an estimator to sit there and calculate all the extensions—and be subject to all the possible errors entailed in that approach.

Again, saving time gives you extra time to think. Why waste such a precious commodity as time.

**DIMENSIONS:** What keeps coming through in this conversation is time saving. That's all the computer can do is save time?

**LLEWELLYN:** That’s not correct. What else is it good for? Anything the computer can do, you or I can do . . .

It just takes longer if we do it manually, right? The computer will do it the same way every time—if you first tell it how you want it done. That’s all we’ve done—so estimators can gain and strengthen their feel for a job, so they can have time to analyze and adjust.

Look, any computer does two things that just aren’t available to the manual type approach:

First, it gives you information to analyze, and

Second, it gives you time to analyze.

I’ve been around construction long enough to know that many bids are really determined by a considerably less than scientific approach. With time at a premium because the bid must go in within 30 minutes, the contractor sits in his office with the estimator and they ask each other,
“what do you think?” or “who else is bidding this?” From that a number is developed and that’s the one that goes in.

DIMENSIONS: Wall and ceiling work is labor intensive. Labor is the one element that is so confoundingly difficult to predict with certainty. So many things can go wrong.

Isn’t that the basis of much of the concern over computer estimating . . . that it’s just too coldly cut for such a vague area as labor?

LLEWELLYN: That’s true, and he should be concerned about labor, too. If you apply a computer effectively, though, it will provide an enormous edge for effectively adjusting labor.

Labor is the one thing that worries a contractor, as you said, and it’s the most important element in bidding.

Keep something else in mind, too. With the few keystrokes you can enter that odd ball item. That is, you can quickly switch to manual operation, enter and adjust your data, and then flip right back to the system operation.

With any manual operation you can enter it as a lump sum or as a miscellaneous item and then go on.

We haven’t removed the manual method of estimating by any means. Truth is, if you really wanted to—and I don’t know why any professional estimator would consider it—you could manually operate our entire system.

DIMENSIONS: We haven’t spoken much about pricing? Why?

LLEWELLYN: In the wall and ceiling industry there isn’t that much to talk about. Therefore, we pretty much leave it up to the contractor.

With material prices, we can’t help out much in the wall and ceiling industry because, as I said earlier, there’s no national pricing service such as in the electrical, sheet metal, or mechanical business.

DIMENSIONS: It’s a rather flat question for you, but you don’t see much validity for a contractor or estimator to remain “outside” on computer estimating, do you?

LLEWELLYN: I realize I’m a manufacturer of computerized estimating systems. But in all honesty if the Lord ever created a business application that was ideally suited for a computer it would be estimating.

It’s pure math and clerical except for the evaluation process. For years, an estimator’s time has been most heavily invested in the clerical function with minimum time for analysis. Now that ratio can be reversed.

These days you can get the math and clerical part entered accurately and then you can analyze-and adjust if you want-every defined area of the project in detail.

There’s really little difference in the manual or computer approach to a takeoff except that with a computer the whole process is easier, quicker, and more accurate. You get your totals in labor phases, and these can be used for budget figures for your job costing. All with a few keystrokes.

That’s professional specialty construction estimating at its best.

DIMENSIONS: Then what is holding back so many contractors
from stepping in, so to speak? Computer trauma . . . the fear of the machine itself?

LLEWELLYN: Perhaps. The computer revolution isn’t very old . . . only 16 years. That’s not very long.

Like other industries with the same people problem, we now must address ourselves to the understandable anxieties of a contractor exposing himself and his business fortunes to an entirely new technology for which he has no background. That’s a very difficult challenge.

Over the last 15 years, though, computer estimating has pretty much proven itself so it isn’t as difficult to talk with a contractor today as it was when we were pioneering the product.

Most contractors now know that they will be forced to come to grips when we were pioneering the product. As it was proven itself so it isn’t as difficult to talk with a contractor today as it was when we were pioneering the product.

DIMENSIONS: How about the estimator who contends that he must change his way of doing things to some programmer’s idea of the way estimating should be conducted. In other words, everyone has to put on the same grey suit?

LLEWELLYN: That’s another wrong perception. It was contractors themselves who have been responsible for the evolution of this system. They told us what they felt was needed in the program with the result that it’s now flexible enough to conform to the way the contractor wants things.

From customizing each installation, we now have a standard product that allows the contractor himself to customize. That’s progress-resulting from contractor feedback.

I can understand that anti “get in line” attitude. An estimator builds his skills over years of trial and error and he’s hesitant about moving away from a proven method. But our programs are written only in response to contractor needs.

That’s why we can accommodate any estimator in any way he wants to apply labor to his estimate. Our system doesn’t force anyone into a grey suit.

DIMENSIONS: In the last analysis, you’ve emphasized flexibility essentially in the labor area, allowing estimators to customize around that entity?

LLEWELLYN: Right. It’s no secret that estimating systems generally differ in the way the contractor or estimator deals with labor. Some are very specific on the way it’s applied. Our programs must be sufficiently flexible that we can match up with these different methods or philosophies.

You get all kinds of comments and criticism no matter what you do, of course. Some say the contractor must be more disciplined in the way he carries out his estimating function. Others feel that the contractor knows what he’s doing and therefore the programs should conform to his stated wants . . . not what you feel he should want.

Obviously, we are consistent with the latter view.

DIMENSIONS: I would assume therefore that your company programmers are constantly busy?

LLEWELLYN: Indeed they are very busy. We have a staff of programmers and they are constantly doing research and development, constantly refining the systems. It takes a lot of writing and rewriting to get a top system. It takes a lot more to stay there once you’ve reached the epitome.

DIMENSIONS: In your software, I notice all items are for specialty contractors. What about the general contractor?

LLEWELLYN: We stick to what we know best-specialty contracting.

The general contractor is another whole different game anyway. His requirements are different. The specialty must conduct an accurate takeoff and detail his prices. He must be exact. The general wants broad numbers because his specific numbers will come from the bids he receives or negotiates.

The GC is more in a monitoring mode. He wants to know various specialty prices but only within a certain range for budget purposes. He can refine his guesses: the specialty contractor must live with his estimates.

DIMENSIONS: The general consensus is that soon a contractor will be forced to involve his estimating functions with a computer . . . just to stay with the competition.

How much longer can the manual estimating system hold out?

LLEWELLYN: There’s no such thing as the end of manual estimating. I do feel, though, that so-called holdouts are missing the boat. I honestly and objectively believe that with a well defined system and if they’re built their labor data file the result will be tremendous benefits.

They’ll react like other contractors who previously hadn’t touched a computer: “Why didn’t somebody tell me. I waited to long.”

It’s a technology that is available and takes some of the drudgery and risk out of contracting. Why not use such a technology?

Of course, there’s a risk or fear element. But the fear is really groundless.

You know I speak publicly a great deal in behalf of computer estimating. One of my favorite devices is to survey the audience.

I first ask, “How many of you now have computers in your operation?” A number of hands go up.

Then I ask, “How many have plans to computerize some portion of your business operations?” Nearly all the remaining hands go up.

Finally, I ask, “How many of you expect to computerize your estimating?” About 30 percent of the hands go up.

That’s a lot better response than we used to get. The battle of acceptance is not as bad today as previously. I expect to see the day when all estimating is done with a computer.

It’s the tool of the future and contractors are responding to it as such.