A computer can offer advantages, but an objective evaluation is the first step

COMPUTERIZED ESTIMATING: A Tool—Not a Master

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In the past several years, a great deal of curiosity has developed regarding the application of computers to the construction estimating process.

This is due in large part to the recent advances in the field of electronics which make computerization possible at a relatively low cost, as well as the ability to specialize electronic products for a specific application.

Secondly, the construction industry has realized that estimating—even though it is probably the most critical phase of a contractor’s success and profitability—by and large is being done with old-fashioned manual techniques.

Computers in general have afforded to businesses of all types several generally accepted advantages:

A. A dramatic speed-up of the processing of data as far as the mathematics and summary of data are concerned.

B. Elimination of the manual handling of data, thereby eliminating the chance for incorrect transposition, misreading, and incorrect distribution to any summary of data.

As stated previously, these advantages are acknowledged by all types of business and commerce. The question we are addressing is how and when do they apply to the contractor in the area of estimating, and at what level can the cost be justified.

To objectively consider the application of computerized estimating, let’s consider the functions of the estimating process which, with rare exception, is being done manually by the vast majority of contractors:

1. Blue print take-off Converting from a set of plans to the actual dimensions and quantities involved in each component of the job.

2. Converting dimensions to material quantities through the process of mathematical formulation, i.e.: cubic yards, square feet, linear feet, square yards, pounds, tons, etc.

3. Summarizing material quantities by category, structure, size, labor class, etc.

4. Applying a labor cost factor to each item in the material summary, and having labor computed automatically by factors being built into the program constants.

5. Applying a material cost factor to each item in the material summary.

6. Analyzing particular labor conditions which may require an adjustment to what would be the normal labor production rate and modifying labor cost accordingly.

7. Reviewing in detail and applying the relative cost for all the incidental general conditions related to the job, i.e.: labor burden, possible labor and/or material price escalation, set-up, bonding cost, travel, equipment, supervision, security, etc.

8. Summarizing all the various cost figures to a final bid price.

In attempting to measure the value of computerized estimating against each of the points listed above, the reader should recognize that there are two categories of computers that exist—namely, a large scale expensive computing system which would handle all phases of data processing within a company such as accounting, job cost control, inventory, accounts receivable, accounts payable, etc., in addition to the estimating function.
The advantage of this type of complete system is the correlation between processing the job estimate and job cost control, payroll, and inventory.

The disadvantage is that, because of the cost involved, only the larger type of contractor can afford and justify it.

Secondly, the requirement for specialized personnel exists, and thirdly, no large scale data processing system is specialized enough to deal with the first point of the estimating functions, namely, blue-print take-off.

Therefore, our analysis will be restricted to the small mini-computer/programmable calculator class of system specifically designed for the construction estimating function.

The advantages as related to the primary function in the estimating process we detailed before are:

A. Blue-print take-off: There are some systems available which combine the function of electronic scaling and counting devices which feed the take-off data directly into the estimating system. This type affords the advantage of minimizing one of the major risks in estimating, namely, omission or duplication of items of take-off.

As the scaling or counting is being done, the quantities are automatically fed into the system and recorded, while simultaneously the plan is being marked to indicate what has already been taken-off.

Another of the major advantages to this type of system is that the process done manually is subject to all the human pitfalls such as mis-measuring, reading incorrectly, transposition, etc.

B. Items 2 and 3, namely, all the conversions from dimensions and items to quantities and the summarization thereof; the computer affords the tremendous benefit of totally removing the manual mathematical and recap activity, therefore eliminating one of the most time-consuming elements of the estimating process. Additionally, these areas are also very prone to human error.

C. Items 4 and 5 can be handled automatically by the system or optionally at the print-out of the material summary. The program can be devised so that the system will stop and require the entry of the price factor for each item of material.

In either case, the advantage lies in the elimination of the tremendous amount of manual price and labor extensions.

D. Item 6—analysis of labor conditions. The system, depending on the proper programming, can be devised so that not only can labor condition adjustments be dealt with, but emphasis is placed on analysis of labor conditions.

E. Item 7—The program can be developed to create a computerized check list whereby the system will actually list for the estimator’s consideration the general condition items that should be considered in every case forcing the estimators to deal with them.

The advantages summarized above represent a tremendous improvement in a company’s estimating, in fact, providing a dramatic reduction in bid preparation time results in the ability to produce more bids or allow for a great deal more time being devoted to the analysis of special labor and job conditions.

Generally, with the manual take-off and recap activity the estimator rarely can apply his knowledge to such analysis. In short, the benefits can be many and for the contractor the investment can be a very wise one.

Reasonable Price

The mini-computer/programmable calculator system heretofore described is pricewise within the reach of just about any size contractor, requires no special personnel, and in effect can be the estimator’s tool rather than his master.

Some important considerations the contractor should contemplate in evaluating the possibility of utilizing this type of system are:

1. Are your estimating requirements going to be of such a nature that the benefits outlined are of value to you?

2. Are your personnel the type that would welcome rather than resist a change of this type?

3. In considering a specific system, does the manufacturer of that system have sufficient background and experience in the estimating field to be able to create the proper software (programs) for your specific needs, as each company’s estimating techniques and philosophies are different? Therefore, the system being considered should be able to deal with programming on a customized basis at a reasonable cost.

4. Does the system being considered have sufficient flexibility to deal with the variations that are always present in the estimating function?

Obviously, not every contractor can justify or effectively use computerized estimating, but the overall advantages possible could be of extreme importance in an economic period which requires in many cases more bidding activity to compete for a smaller volume of work available.