Quantity Surveying Applications — I

The Third in a Series of Articles by Brian L Atkin, Bsc (Hons), AIQS, ARICS

It may be said with some degree of confidence that applications will be endless, since in theory it is possible to produce a program solution for just about anything, *or is it*? This suggestion of doubt is, suffice to say, the underlying thought behind this article.

In addition, it has been said that the micro-computer is only the latest in the ever expanding range of technological innovations making their own special contribution to the office of the present. Micro-computers are intended to assist in the means to an end but should never be considered as an end in themselves. Of course, we must see the micro-computer as a valuable management tool, its possibilities endless but its appetite for attention daunting! The ability to translate professional duties and expertise into a workable solution is almost entirely dependant upon the *translator*. Such a person need not necessarily be a qualified programmer *(systems analyst)* and may in fact be several persons, although the actual interaction of the various personalities will have to be carefully considered as this may be a significant factor in the success or otherwise of the end product. Essentially, programs tend to reflect the personality of their author in much the same way as do books.

In considering actual applications it must be stressed that these are likely to vary according to the interpretation of the task to be performed, as procedures will often be found to differ from one person to another. A typical example is to be found in approaches to cost planning as this will no doubt differ from one organisation to the next and probably between any two individuals.

Specific applications for quantity surveyors can be considered under two heads, firstly, for the contractor and secondly, for the private office. An initial approach in the determination of suitable applications would consider two prime objectives:
1. Maximising profits.
2. Increasing efficiency.
These ends may be achieved by any combination of items in the list that follows, which is not exhaustive nor is it supposed to be wholly representative of every office practice:

For the Contractor —
   Pre-Contract
   Resource Planning (Manpower, etc.)
   Operations Analysis (CPA)
   Cost Estimation (Bidding)

   Post-Contract
   Resource Management (Manpower, etc.)
   Programme Control (CPA)
   Cost Recovery (Valuations)
   Cost Control (Monitoring)

For the Private Office —
   Pre-Contract
   Cost Control (DE/CP)
   Tender Documentation

   Post-Contract
   Financial Control (Monitoring)
   Variations, Final Account
   Project Cost Appraisal (Valuations, NEDO, etc.)

For Both —
   Cost Data
   Contractual Advice
   Office Management — Resource Analysis
                    Invoicing
                    Receipt
                    Payment
                    Reports
                    Accounts (& VAT)
                    Payrolls
                    Word Processing
                    DBMS

(DE = Design Economics: CP = Cost Planning/Cost Modelling).
(DBMS = Data Base Management System/General Handling & Sortation.)

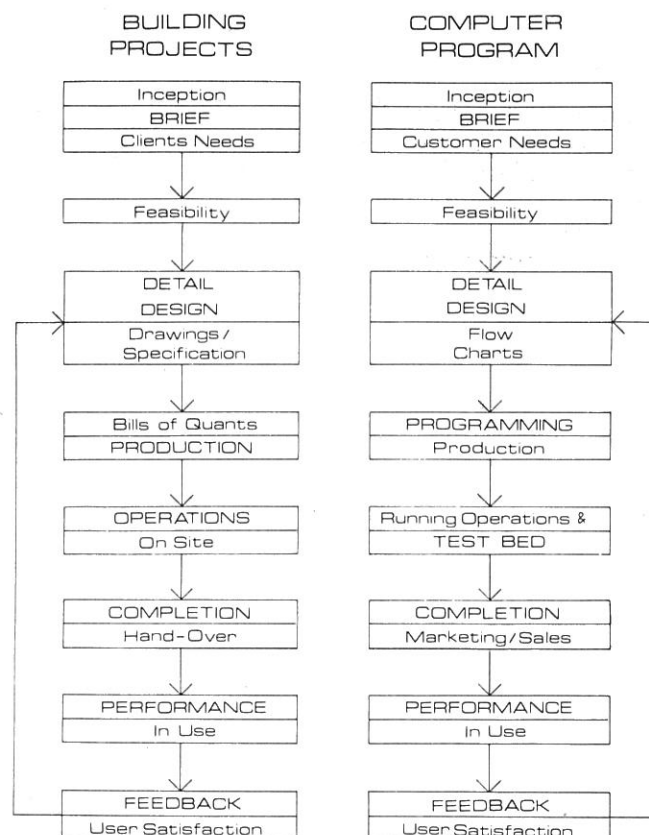A simple form of program (+ *manual* = *software*) is one which is capable of being directly

BUILDING PROJECTS | COMPUTER PROGRAM

FIGURE : 1 'Logical Sequence Of Events In Producing Computer Programs Compared With Building Projects'

keyed into the internal memory of the micro-computer without any previous planning. A program of this level is unlikely to have its origins in quantity surveying since if it did then a few hours work would produce the ultimate in software, the Do It Yourself QS package! Quite obviously, the fact that relatively little has been achieved, in terms of programs, in the past is perhaps indicative of the very nature of the profession's work.

Any program must commence with a brief no matter how simplistic in approach. Writing a program is often an involved and complex procedure. A parallel situation is to be found in the design and construction of a building:

It is not suggested that the degree of planning necessitated by a building project will be at all duplicated in the production of quantity surveying software. However, there are certain basic activities to consider in what must be a logical plan of action within the overall method of approach. Again it has to be said that we are interested only in producing the means to an end. Whilst this comment is obviously generally accepted for building projects there are an unfortunate few misguided individuals who seem to have almost lost their way in striving to produce QS software.

Software to date is not extensive nor has it revolutionised those procedures for which it was developed. Admittedly, software such as the NEDO packages have proved fairly cost effective but they hardly justify the purchase of the micro on their own. Of course, more will become available as time goes by. Furthermore, and at the risk of offending those in business to develop and sell software, there is little *off-the-peg* software other than the *Mickey Mouse* packages for payroll, accounts, WP, etc. Perhaps this attitude is somewhat extreme and maybe there is merit in investing in a micro-computer even if in the early days it is used for *run of the mill* office management routines. The present lack of advertised software for the profession is probably rather more indicative of activity behind the scenes than none at all.

Examples of non-commercial software development to date are those programs developed and produced within the Department of Surveying, Liverpool Polytechnic and include:

    i) Measurement & Documentation — Elemental Take-Off & Bill.

    ii) Building Economics — Cost Analysis/Plan — Cash Flow Forecast.

    iii) Project Control — NEDO Valuation.

The above are used solely for in-house teaching and demonstrations to the profession. They exist to prove the theory and stimulate others into developing applications for daily practical use.

The production of software can have serious implications for the author since the responsibility for accurate and competent compilation together with a back-up servicing facility must be guaranteed when the money is handed over. If you intend to develop programs for your own organisation then ask yourself the question — *"Will the end product be of a standard that would be good enough to sell to fellow professionals?"* If the answer is yes, then well done, continue with the good work! However, if you cannot truthfully answer in the affirmative then you ought to be asking yourself some straight-forward questions. In any event the options open to the profession, in terms of software avail-

ability, can be considered under three main heads:
a) Shelf.
b) Purpose Written.
c) User Produced.

Off the shelf propositions have already been dealt with in terms of availability. A further aspect in considering a software package relates to the provision of a guide (or manual) to the program. In this connection it is suggested that any program offered on the market, on its own, without literature but with the somewhat glib comment — *"Just push the diskette into the drive and all will be explained"* is really nothing short of rubbish. It may be said that a fair guide to the adequacy and efficiency of a program is to be found in its manual, which may run from a few to many 10's of pages. A rough framework for a manual, by which to judge some of the important merits of a program, would be as follows:

1. Program Synopsis;
2. Contents of Package;
3. Hardware Requirements eg — Installation — Use of Disk Operating System;

Brian L. Atkin

4. General Operation;
5. Data Preparation — By the Quantity Surveyor — For Use by the Operator;
6. Operating Sequence — Menu Selection;
7. Output Formatting;
8. Protection of Software — Mishaps — Security;
9. Warranty, Ownership & Copyright Provisions.

(Note the inclusion of references to the hardware)

One simple way of assessing the value of a manual and for that matter the software as a whole, is to award a star rating against each of the areas covered by the manual. Any package attracting less than, say, 75% of a possible total is probably not worth considering further.

In concluding references to manuals, it is worth considering the case of estimates for building work which one would expect to accurately represent the cost but perhaps qualified in terms of price level, fluctuations, exclusions, etc. It is, therefore, quite reasonable to expect an adequate explanation to accompany the program, which

like the estimate has been structured in a particular way, giving the user the benefit of the exact intentions of the author. Remember the saying, *all things to all men.*

Almost all programs for micro-computers are written in BASIC, however, numerous versions (or dialects) will ensure that software created, say, for APPLE II will not *run* on PET Commodore, and *vice versa*. It would be a folly to suggest that the user could make the necessary modifications, since the structure of the languages and more especially the disk commands will create havoc for the amateur. Bugs may occur, never to be detected until too late, when a mistake could cost dearly. Therefore, it is imperative that the potential purchaser should be aware of the particular version of BASIC, currently being offered and also likely to be offered in the future. A costly lesson may be learned if a machine is purchased on hardware merits alone, only to find that the available software *runs* on something else.

Self programs may, by their very nature, fall short of users' expectations often necessitating modifications. The responsibility for carrying this work out is best placed in the hands of the author (or supplier). With this in mind the user may very well secure a low cost software package tailored to his needs.

Instances will arise when the extent and related cost make modifications unviable. In this situation there are but two options left open, namely, to have programs purpose written or else to write them yourself. The latter option must surely be the breeding ground for many disillusioned users at present. It may have been that their only mistake was to have believed in all the self-convincing advertising gimmickery, and those jargon spouting salesmen. True enough, BASIC programming is easy to learn but for sophisticated and efficient programs it is suggested that a sound working knowledge of mathematics, rather than mere arithmetic is needed to succeed. The main commodity that the Quantity Surveyor has, that no other individual has, is an intimate knowledge of quantity surveying. Can it be said that the same Quantity Surveyor has an equally sound knowledge of computing science? No, of course it can't. Maybe this is part of the problem when individuals begin to find the novelty wearing off.

To suggest a solution to the problem, assuming there is one, needs a general acceptance of the facts; Quantity Surveyors are experts at quantity surveying and Systems Analysts are experts with computers. Then why not take advantage of a symbiotic relationship, as a means to achieving the identified end. Each and every program has a life cycle, as outlined in Figure I, so why not distribute the load as shown below:

To illustrate this point by an example could produce the following analysis. If a program takes say 100 hours to produce, perhaps 50 hours might be spent setting down the brief and logic charts. The remaining 50 hours are spent producing the program (writing instructions). In addition to the basic 100 hours, as many hours again could be spent in general debugging and testing the performance. A program for an application such as NEDO Formula Price Adjustment cannot be produced in one week and then released to the entire profession. Six months of constant use would be more realistic if the

Powers of the Engineer in Settlement of Disputes under the FIDIC-Conditions

And suggestions for simplifying the settlement of dispute in general—

by Dr Jur P. P. Poetis

I. APPARENT POWER OF THE ENGINEER
(A) Standard Contract Provisions for Settlement of Disputes

Clause 67 of the FIDIC-Conditions (*Conditions of Contract (International) for Works of Civil Engineering Construction, 3rd edition March 1977, of the Fédération Internationale des Ingénieurs — Conseils*) contains the following provisions with regard to the subject of 'Settlement of Disputes — Arbitration':

'If any dispute or difference of any kind whatsoever shall arise between Employer and the Contractor in connection with, or arising out of the Contract, or the execution of the Works, whether during the progress of the Works or after their completion and whether before or after the termination, abandonment or breach of the Contract, it shall, in the first place, be referred to and settled by the Engineer who shall, within a period of ninety days after being requested by either party to do so, give notice of his decision to the Employer and the Contractor. Subject to arbitration, as hereinafter provided, such decision in respect of every matter so referred shall be final and binding upon the Employer and the Contractor and shall forthwith be given effect to by the Employer and by the Contractor, who shall proceed with the execution of the Works with all due diligence whether he or the Employer requires arbitration, as hereinafter provided, or not. If the Engineer has given written notice of his decision to the Employer and the Contractor and no claim to arbitration has been communicated to him by either the Employer or the Contractor within a period of ninety days from receipt of such notice, the said decision shall remain final and binding upon the Employer and the Contractor. If the Engineer shall fail to give notice of his decision, as aforesaid, within a period of ninety days after being requested as aforesaid, or if either the Employer or the Contractor be dissatisfied with any such decision, then and in any such case either the Employer or the Contractor may within ninety days after receiving notice of such decision, or within ninety days after the expiration of the first-named period of ninety days, or as the case may be, require that the matters or matters in dispute be referred to arbitration as hereinafter provided. All disputes or differences in respect of which the decision, if any, of the Engineer has not become final and binding as aforesaid shall be finally settled under the Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators appointed under such Rules. The said arbitrator/s shall have full power to open up, revise and review any decision, opinion, direction, certificate or valuation of the Engineer. Neither party shall be limited in the proceedings before such arbitrator/s to the evidence or arguments put before the Engineer for the purpose of obtaining his said decision. No decision given by the Engineer in accordance with the foregoing provisions shall disqualify him from being called as a witness and giving evidence before the arbitrator/s on any matter whatsoever relevant to the dispute or difference referred to the arbitrator/s as aforesaid. The reference to arbitration may proceed notwithstanding that the Works shall not then be or be alleged to be complete, provided always that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Works.'

(B) Prima Facie Meaning of Clause 67

1. The Engineer seems to have power to decide on any type of dispute. A dispute should not be interpreted to mean a mere difference of opinion but it may well include a legal dispute or a dispute on legal points.

   The Engineer seems to be able, at any stage of the contract, to decide over disputes between the Engineer himself and the Contractor. The Engineer being, in such cases, himself a party, no request from the Contractor (or, of course, the Employer) appears to be necessary.

   The clause provides that all these disputes shall have to be referred, by either party, in the first place to and settled by the **Engineer**. If the expression 'either party' refers to the party of this clause (and not, for instance, to the parties of the contract), then it is implied that the Engineer may, without consultation with the Employer, refer what the Engineer himself styles a dispute or difference of opinion between the Contractor and the Engineer to the Engineer himself.

   The Engineer's decision shall then be final and binding, however subject to arbitration or if no arbitration is opened by either of the parties to the contract within a period of 90 days.

2. The face of Clause 67 has lead several

Each side must complement the other

QUANTITY SURVEYOR produces:
Brief
Logic Charts
Test Bed
Part Manual

SYSTEMS ANALYST produces:
Logic Tests
Program
Debugging
Part Manual

in order to produce the bond necessary for the success of the end product
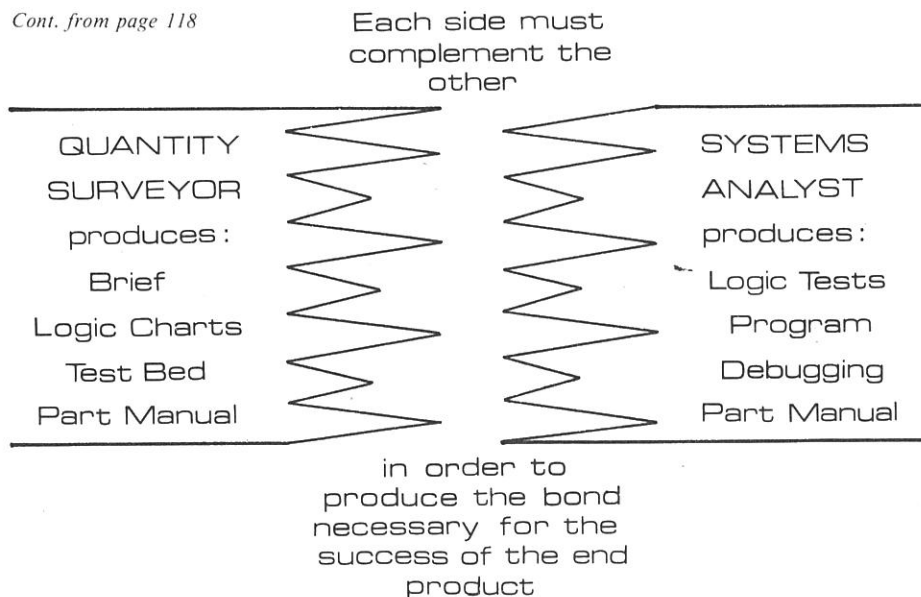
FIGURE: 2 'Ensuring Adequacy And Accuracy In The Production Of Software

program were to ensure a 99.9% elimination of bugs. Can you also imagine the problems that firming-up causes even when carried out manually, especially when the final account has to be passed to an auditor?

Producing programs for quantity surveying is not a licence to print money, it is a serious professional and demanding business.

Again, a final few words. There seems to be little advantage in rushing out to buy systems which at present have limited software coverage. After all the profession has coped without microcomputers until now. Micros are new, let's take them in our stride and remember the program applications are only as good as the person who produced them.