GUIDELINES FOR SOFTWARE ACQUISITION

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Computer users require software for specific applications but are sometimes unable to decide as to whether they should go in for its in-house development or acquisition from external sources. And in case a decision is taken to buy the software, how should they go about the task? This article endeavours to answer such questions for the guidance of a user in respect of various steps in software acquisition, viz. feasibility study, market exploration, software selection process, vendor selection, benchmarking, etc. The suggestions made are based primarily on the long experience of the authors in the area of computer software.

1. INTRODUCTION

Computer users are frequently required to take vital decisions in respect of purchase of software. Success in computer operation, depends to a large extent, on the correct choices made in this respect. The present article, arising out of the authors' extensive experience in in-house development of software as also their acquisition from external sources, lays down broad guidelines for procedure of software purchase for the benefit of users intending to acquire software from external sources. However, this article does not cover the aspect of computer virus which has in recent years become a matter of concern for both computer professionals and users.

1.1 National Scene in Computer Software

India made its entry into the computer age in a small way in the sixties with the acquisition of a few institutional minicomputers. Some more minicomputers and a few mainframes made their appearance during the seventies. Apart from the executive/ supervisor, the only software ordered along with these machines included compilers of then-in-use high-level languages, assembler, system utilities and a limited range of specific packages for business, industrial or scientific use.

The decade of the eighties saw a major shift from minicomputers to micro-computers initially and then to the IBM-compatible personal computers (PCs). Desktop computers, as powerful as the minis, with much smaller space and installation requirements, and at just a fraction of the mini's cost became available. The IBM compatible PCs and their clones revolutionised the approach to the use of computer. The portable 4GL software available on these machines eliminated the need for tedious application programming. This has made the PCs very popular and brought them within the reach of every researcher to work with and manager

for performing decision-support functions. The favourable government policy has also played a major role in the proliferation of computers and their suppliers.

With a steep rise in the number of computers and their users, there has also been a rise in the demand for software. This has led to the development of a large number of software packages. At one end of the spectrum are packages which are tuned-up versions of the existing IBM-PC software, offering some improved or added features over the initial package, and at the other end are packages developed specifically to suit the Indian user environment. The software consultancy service organisations take up customised application development for the users.

1.2 Software Requirements in DRDO

Development of software for implementation of complex projects needs a strong base in terms of software specialists. In DRDO, this resource is somewhat limited and for this reason in-house development is at times *hampered. The management thus has to* study and evaluate the software available from various software houses. The packages may be available off-the-shelf or customised.

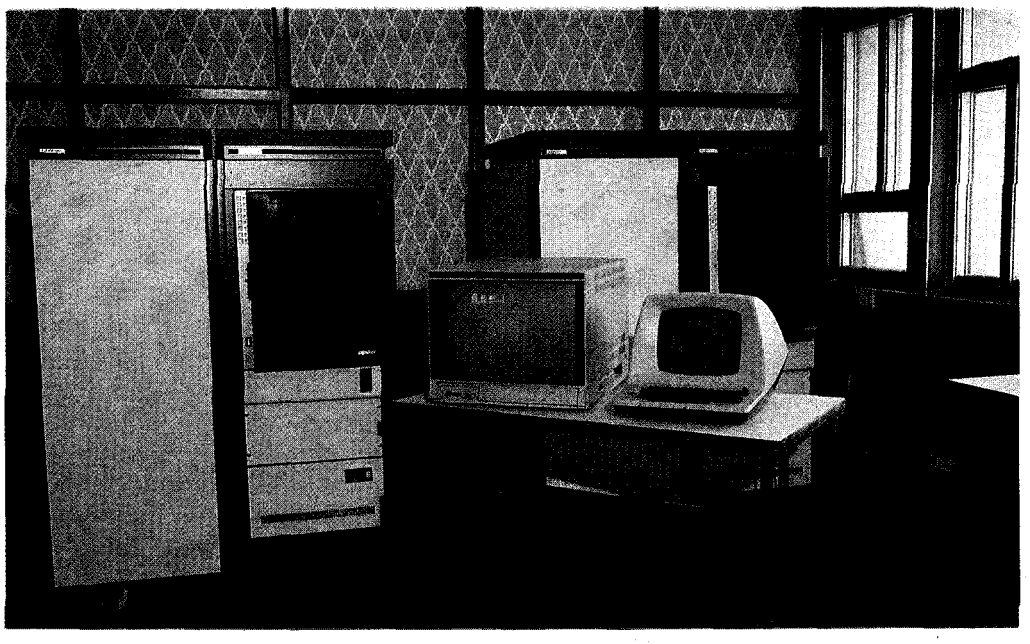
2. ACQUISITION OF SOFTWARE

2.1 Feasibility Study

Studies on the software requirement of the project and the corresponding available resources would enable the user to evaluate the possibility of in-house development of the software for the project *vis-a-vis* its acquisition from external sources. Constraints of expertise and time may force the user to decide in favour of acquiring software from an outside agency.

2.2 Market Exploration

The user has to contact the vendors who are likely to have developed the kind of software required for the project for a discussion on the user software requirements. After having understood the requirements, the vendors would either offer a package which can be



System using image processing software

supplied off-the-shelf or offer to develop a customised package which would meet the user requirements. They would also submit quotations regarding price and specify terms and conditions about payment.

2.3 Software Package Selection

Of the several options available, selection of the right software package mainly for its long-term effectiveness is a difficult task.

Although several packages may appear similar, they may not necessarily have the same capability. An ideal package is not just a software. It is also expected to provide for implementation planning, formalised education, continual structured support, on-going enhancement programmes, and user-interaction.

Adoption of a logical approach and fixing of precise criteria is necessary for making a sound evaluation. The following are the major parameters to be taken into consideration in this respect:

2.3.1 Technical Soundness : The package should be technically sound, and capable of meeting all the requirements of the user.

2.3.2 User-friendliness : The software should be user-friendly, i.e. it should be easily understandable and operable with minimum mental strain and physical effort on the part of the user.

2.3.3 System Changes : The package should be amenable to incorporation of such changes as may be necessary, including initial changes, changes imposed by program maintenance and as also those associated with extension of package facilities. It is important to fix the responsibility for affecting these changes. Should it be the user's responsibility then the vendor should provide source listings of the package and should guarantee the following :

(i) *Modularity of Design* : The package should be modular in design, with structured coding, i.e. it should be a self - contained unit.

(ii) *Documentation* : Full and good quality documentation must be provided by the vendor. Anything less than full documentation should not be accepted. Complete documentation pertains to areas like

- identification of input and output elements,
- full record specifications,
- program logic,
- data specification,
- test data and
- Operating and conversion procedures.

2.3.4 Installation and Training Support : The supplier should specify the support which he would provide with the package. It must include help during conversion and initial running, together with formal education programme for the user's team.

2.3.5 Initial and Running Costs : The acquisition modes vary considerably across the range of packages available. Some packages are offered only for direct purchase by the users, while others are custom-built with provision for payment on the basis of stage-wise development. Maintenance support charges are usually included in the contract. In such cases, where separate charges are to be paid for maintenance purposes, clear settlement must be done within the framework of financial terms.

2.3.6 Acceptance Tests : The conformity of packages to user requirements is determined for ready-built and custom-built packages. In the case of custom-built packages, continual and meaningful dialogue between the user and the vendor is necessary to ensure generation of a potentially successful package. The acceptance tests run on the software packages include :

(i) Test Running, done on the test-data

specially created for the purpose,

(ii) Pilot Running, based on data provided by the user, and

(iii) Parallel Running, based on live data used by the system/project for which the package is acquired.

2.3.7 Quality Assurance : The package selected by the user should not only be capable of serving its desired purpose but should also be adaptable, reliable and of good quality.

2.3.8 Maintenance Support Assurance : The user should ensure that the vendor can provide continued and the best possible maintenance support.

2.3.9 Technology Application : An important consideration is whether current technology is being applied to make the software package really effective in terms of timeliness, accuracy, ability to handle data at reasonable cost and capability to handle potential security.

2.3.10 Compatibility, Control and Recovery Problems : The prime concern at the time of acquisition of a software package is its compatibility with the user's existing hardware and software configuration and the familiarity and specialisation of the supplier in that environment. That way the supplier will be able to communicate better with the user and consequently ensure smooth installation and on-going support.

2.3.11 Vendor Selection : The first step is to shortlist the suppliers who are able to provide the required package on the basis of set criteria. The vendors considered should be financially stable, be dedicated suppliers of software, be true professionals, have industry recognition and a good reputation.

For effective support and quality-assurance, the vendor must meet the following requirements :

(i) The representation and stability of the vendor company is essential for the future support of the system. In such cases where phased extensions have been envisaged in the system plans, a disastrous situation can arise if the vendor company goes into liquidation just when the user is about to implement a major extension programme . It is, therefore, essential that the vendor company chosen has a sound financial backing and a strong customer base.

(ii) The vendor must have adequate staff and technical resources so as to be in a position to provide the requisite maintenance support.

Software processing of a digital image

2.3.12 Benchmarking : A software package must not be acquired merely on the basis of its reputation. It has to be tested in actual user environment. Benchmarking tests are necessary to evaluate the relative performance of the software package. However, the user has to be clear that the tests must not be unduly complex; instead these should be realistic and relevant. Setting proper tests may involve days or even weeks of manual work. Users should set the test-plans for software efficiency, quality and reliability.

In case the package to be acquired is only a module to be integrated with other modules, it is imperative to ensure interfacing of

the module with other modules of the integrated package.

3. CONCLUSION

The use of computer has increased tremendously over the years. Lower hardware costs are bringing computers within the reach of more and more users. Software requirements of the users are also simultaneously going up and one can see a number of specialist software-development houses coming up. The software costs, however, continue to be high and a user has to be very circumspect in software procurement. Selection process is a complex job. The above guidelines based on several years of experience of the authors in the software development/ acquisition for super-minis, PCs and other special-purpose systems, have been laid down with the purpose of helping the users to take appropriate decisions while purchasing software from external sources.

"Knowledge is a steep which few may climb while duty is a path which all may tread."

-LEWIS MORRIS

"Books are good enough in there own way but they are a mighty bloodless substitute for life."

-RL STÉVENSON