

THE DEVELOPMENT OF COMPUTERIZED PLANT MANAGEMENT SYSTEMS: THE ROLE OF THE MANAGER

by D.A. Domke

Most commercial arborists and urban forest managers are not typically computer specialists. Nonetheless, these managers are usually aware of the benefits of computer technology and their applicability to tree management. The proper development of a computerized plant management system requires a manager's sustained commitment from the initial stages of planning to the daily operation of the system. Ultimately, the degree of involvement from the manager may determine system success or failure.

This article provides initial planning guidelines in the development of computerized systems such as those used for landscape, street tree, nursery, or integrated pest management. The guidelines are first designed to assist the manager in the determination of initial system feasibility before other, more technically-oriented personnel become involved in the project. Two alternative approaches are then presented for system development.

Preliminary Needs Assessment

Before consultants, vendors, or other computer personnel become involved in the development of the proposed system, the manager should complete a preliminary needs assessment of the system (Figure 1). This assessment requires little time to complete, determines specific system objectives, and assesses general system complexity and constraints. The purpose of this approach is to ensure the proposed system will meet the needs of the intended organization, and provide the manager with sufficient information to determine if system development should proceed.

The manager needs to determine information in three key areas: operational, technical, and economic aspects of the proposed system (Figure 1). The operational components define how the system will generate information to satisfy clerical, technical, and managerial information requirements. The technical aspects primarily

concern the proposed system's computer hardware and software requirements. Finally, the economic aspect refers to limitations imposed for the cost of system development.

At this early stage of development, the manager's most important task is to identify and define the operational requirements of the proposed system. Although it is tempting to become involved with "bytes, RAM, and hard disk capacity," and other hardware terms, the focus of development is on the flow and generation of information. Similarly, the economic requirements of the system are not important since the system must be able to accomplish certain specific objectives or development should not be considered.

The first step of the preliminary needs assessment is to determine the general purpose and specific objectives of the system. Developing and documenting this information is an important activity of the manager since each future stage of development depends on the system objectives.

The purpose states the type of system being developed, it's reason, and general nature. Often the purpose encompasses the ability to increase efficiency and effectiveness of tree management. On the other hand, the specific objectives of the

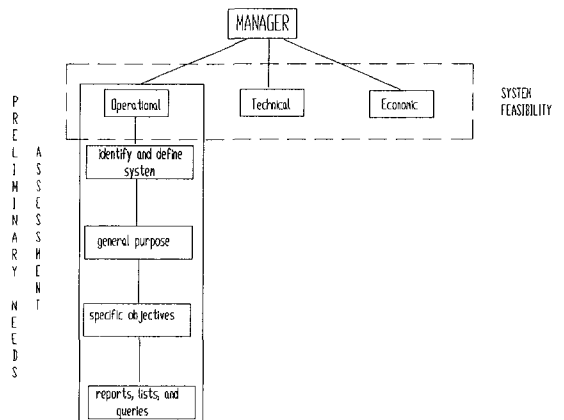


Figure 1. The manager's role in system development.

system state the type and purpose of information required by the organization. For example, a system objective common for a tree management application is "to provide a record of current requests, investigations, and outstanding work orders."

Usually, a system will have approximately five objectives, each satisfying a different information requirement. In addition, these objectives should be prioritized so that Objective 1 is the most important while Objective 5 is the least.

The following scenario best illustrates this idea: *Objective 1.* To provide a method of tracking current tree requests, investigations, and outstanding work orders.

Objective 5. To provide a cumulative value for the urban forest.

This approach preserves the integrity of the system if sacrifices are required for technical or economic reasons later in system development. In this case, Objective 5 would be the first to be excluded from the system before any of the other objectives.

With the objectives on paper, the manager is now able to identify more information by listing the types of reports, lists, and queries for each of these objectives. For simplicity, divide this information into two categories called system requirements and desirable features (1). The difference is that "system requirements" are information that must be included to achieve the stated objective while "desirable features" are not necessary but would be nice to have available. For Objective 1 stated previously, the information generated might include the following:

System Requirements. Reports should be available whereby incoming requests for work are generated for the arborist. In addition, information on the subsequent investigation, management action recommended, and management action taken should be recorded. At each stage, the date, crew, comments, and equipment required (if any) should be recorded.

Desirable Features. Two additional system features are desirable. First, information on the requestor's name, address, and phone number would be helpful. Secondly, the ability to generate reports on time required for each management activity and cost would be useful.

The determination of system requirements and desirable features for each objective concludes the detailed involvement of the manager in system design. The manager may wish to detail some of the system's reports by listing the data variables to be listed on each report. However from this point on, the manager's primary role is to determine the more technical aspects and economic limitations of system development by inquiring about programs available and by consulting with computer personnel.

Software Development Options

With this type of information on hand, the manager is now in an informed position to assess the two basic approaches to software development. These alternatives are to either "make" or "purchase" system software. In the first case, a programmer/analyst is required to develop the program. In the latter case, there is a number of software packages available for purchase that may meet your operational requirements.

In order to "make" system software, a computer consultant would be hired. The major disadvantage of this approach is the usually high cost of development. On the other hand, the major benefit is that the system will specifically meet the needs of your organization.

In order to "purchase" system software, vendors or consultants must be contacted that have pre-programmed software packages available. These packages are usually found through advertisements in trade magazines or displays at conventions.

Currently, there are a number of tree management systems available for the microcomputer. This alternative warrants serious consideration because of their low cost and convenience. Moreover, the packages may sometimes be modified to meet specific needs. The difficulty is that these software packages may not meet the specific system objectives previously formulated.

As manager, your greatest concern is to determine if the pre-programmed software package meets the needs of your organization. This is easily done since you have already determined the specific system objectives of your system. Through reading literature and by asking the vendor questions, you can determine whether or not

the system is viable by comparing each specific objective and the types of reports generated with that of the package. The software package that most closely matches your needs should be given the most serious consideration. It is doubtful whether any package will meet all your needs, however, the availability of modifications should be an important consideration. On the other hand, you may have to sacrifice some of your system requirements for the convenience of purchasing a pre-programmed software package.

Conclusion

The role of the manager in the development of a computerized plant information system is to consider its overall feasibility and to determine the scope and function of the system in an operation environment. A preliminary needs assessment provides the ability to complete these two functions. After this assessment is completed, the manager should assess the technical and economic limitations of the system. In most cases, computer personnel or a consultant will be required to perform this function.

At some point during this process, the manager is faced with three separate options. The first

choice is to not proceed with system development since it is operationally, technically or economically impractical. The second choice is to "make" system software by utilizing the services of a programmer or systems analyst. With the preliminary needs assessment completed, the manager is able to communicate the system requirements precisely to the computer expert. The third choice is the "purchase" of a pre-programmed software package from a vendor that specializes in plant management systems. Usually this is the most economical and convenient solution as long as it meets the basic system requirements.

Literature Cited

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*Plant Management Consultant
67 Treevens Drive
Nepean, Ontario K2J-2E3
Canada*

ABSTRACT

FLEMER, WILLIAM III. 1989. **Correcting pruning mistakes.** Ground Maintenance 24(6):10-12, 14, 16, 20-21.

Too many grounds managers and landscape maintenance firms inherit trees and shrubs that have been improperly pruned by their predecessors. Ideally, plantings should be designed so that remedial pruning can be kept at a minimum. Some problems with ill-tended landscape planting can be solved by corrective pruning and some cannot. Whether better pruning will be effective depends upon the kind of plant that is in bad condition. Deciduous trees and shrubs regenerate much more quickly than broadleaf evergreens and, in most cases, they look quite presentable after the first season's growth following a severe pruning. There are borderline cases when it is hard to decide whether a big, old tree should be cut back and shaped, or felled and replaced with a younger tree. There are no hard-and-fast rules. It depends on the condition of the tree. One of the most common shrub pruning mistakes is cutting them into globe or umbrella shapes with hedging shears. If long-time poor pruning has created ornamental shapes that are expensive to maintain, the best solution is to cut deciduous shrubs to the ground, leaving 4-in. stubs from which new canes can regenerate.