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## Computer Applications: Meeting the information needs of a business

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### ABSTRACT

Computers traditionally make their first appearance in a business as a tool to automate time consuming tasks such as accounting, inventory control and document preparation. However, the true value of a computer system often lies in its ability to provide timely summaries and analyses of business performance.

Business information requirements can be broadly categorised into three areas: operational processing (day to day tasks, data capture), management information (reporting and tracking, tactical planning) and decision support (strategic planning).

Depending on the software used, a computer system can provide information from any of these areas. However, it is unlikely that any single software package can meet all the information needs of a business. It is becoming increasingly important for data to be easily transferred between systems.

This paper looks at the various types of software available, what kinds of information each can provide and the need for integration between packages to provide the "total picture".

### INTRODUCTION

The computer revolution has expanded from its traditional base in large organisations to smaller scale enterprises. As a result of lower hardware costs, there is rapid growth in the use of personal computers (PCs) by small businesses including farming.

New or intending computer users generally consider that a PC will be useful for accounting, budgeting and letter writing. A farm manager might add recording of animal data and pasture growth, and a few other farm specific data collection tasks. These examples all involve the automation of time consuming, routine tasks and are often the easiest computer applications to justify in economic terms.

However labour and cost saving benefits are only one of the potential benefits. Computers can also be used to monitor business performance and improve decision making by providing timely and relevant information. In fact, focusing only on operational benefits may cause a business to overlook the contributions that a computerised "information system" can make to tactical and strategic planning. In a competitive marketplace, it is critical for a business to consider all of its information needs and the ways in which computers can help meet these.

### INFORMATION NEEDS IN COMPUTER PURCHASES

The determination of information needs should be foremost in a potential computer purchaser's mind. Whether buying a computer for the first time or planning to expand a current system, the following steps are important:

- 1) Think about the business needs:  
What problems need solving?  
What questions must be answered?  
What information do I require?
- 2) Look for computer software that will address the identified needs.
- 3) Look for computer hardware that will run the required software.
- 4) Compare costs and benefits.

This is not a trivial process and considerable time and research may be involved. In some cases, it may be cost effective to engage a consultant to help clarify a business's computer needs. For first time users, an extra step can be added at the top of the list: gain computer literacy. An informed purchase requires an informed buyer.

The rest of this paper looks at the first two parts of the process: information needs and computer software; these are certainly the most important considerations. Hardware selection is less critical, being largely dictated by the choice of software. Similarly, a cost benefit comparison will be a much simpler task if a proper assessment of information needs has been made.

### Determining information needs

Computer systems that automate existing manual systems meet a particular need (time savings) but do not offer much in the way of new information about how the business is or should be performing. The most valuable feature of computers is their ability to reorganise, summarise and extrapolate from base data to provide new insights into an enterprise's operation.

It is useful to look at a model of information needs from the discipline of Information Systems (IS) which is the study of how information is provided to support and control an organisation's activities (O'Brien, 1990; Parker, 1989). There is no distinction made between manual or computer based IS; the principle concern is the type of information required.

This model identifies three broad categories of systems:

Category	Attributes
Operational (OS)	<ul style="list-style-type: none"> <li>• Handles day to day processing, eg accounts, stock recording.</li> <li>• Automation of paperwork.</li> <li>• Primary point of data collection.</li> </ul>
Management Information (MIS)	<ul style="list-style-type: none"> <li>• Produces summary reports from base data, eg debtors ledger, sales analysis.</li> <li>• Used for monitoring departmental and overall business performance.</li> </ul>
Decision Support	<ul style="list-style-type: none"> <li>• Helps with forward (strategic) planing.</li> </ul>

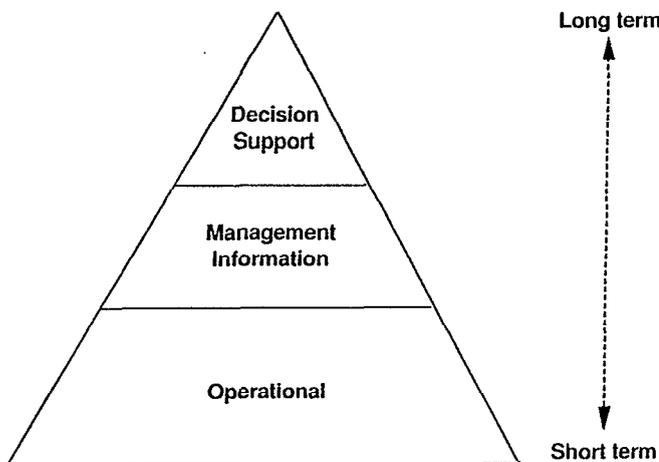
- (DSS)
- Enables prediction of future trends.
  - Allows monitoring of external environment.
  - Uses base and summary data as well as outside information, eg exchange rate, market share.

The justification for OS is usually through reduced workload or staffing requirements while the justification for MIS or DSS is that more informed decisions can be made. OS deal with more short term processing while DSS is concerned with the longer term implications.

These categories correspond roughly to the levels of management typically found in large organisations such as banks and insurance companies. OS would be primarily used by front line and clerical staff, MIS reports would be reviewed by departmental managers and DSS would be used by higher level management.

Figure 1 illustrates the relationships between each category. The size of each section does not indicate its relative importance but rather the amount of data with which it deals. The OS level collects and stores detailed data while the MIS and DSS levels deal with summaries of this base data.

**FIGURE 1** Relationships between different categories of Information systems.



The boundaries between IS levels are not rigid, many commercial systems overlap from one level to another. For example, accounting systems record transactions at the OS level and provide reports at the MIS level.

Despite their reduced size, most small businesses need information from all three levels. The main difference is that the same one or two individuals may perform the tasks associated with each type of system.

### SURVEY OF SOFTWARE PACKAGES

There is a large variety of software packages available for PCs and the list is continually growing. Although the absolute number of packages is large, it is possible to identify several main classifications of software. These are summarised below:

#### (1) Financial packages

These handle the many types of monetary transactions dealt with by a business and produce summary reports. The main functions provided are:

- Accounting  
Cashbook, creditors, debtors, general ledger.
- Inventory  
Recording, reconciliation, reordering.
- Costing  
Stock sale prices, feed costs, budgeting.
- Payroll  
Cheques, tax calculation.

#### (2) "Productivity software"

These packages are so named because they supposedly decrease the amount of effort required for various tasks. However, many times this is not the case because improved efficiency is used to increase the quantity or quality of the output.

- Word Processing (also Desk Top Publishing)  
Letters, reports, brochures.
- Spreadsheet  
Budgeting, calculations, modelling.  
This is the most common package used in business.
- Database  
Record keeping, searching, sorting, reports.  
Designed to handle large volumes of data.

In the PC world, databases are often treated as just another type of productivity software. But in fact there are three very different categories of database. The simplest of these handle a single set of information, ie a card file replacement. These packages are fairly easy to learn and are used for supplier lists, stock records and mailing lists.

More complex systems that support many files (which may be inter-related) are known as relational databases. These are mainly targeted at software developers and have a steep learning curve.

Information which is maintained by an outside source and available to users for a charge (eg stock prices, exchange rate and genetic data) are called external databases.

#### (3) Graphics packages

Spreadsheets and some databases provide methods to graphically display numerical results. However, specialised packages are required for more complex diagrams.

- Drawing packages  
For producing diagrams, graphs, slides.
- Computer Aided Design (CAD)  
For more detailed work such as blueprints and engineering diagrams.
- Geographic Information Systems (GIS)  
A combination of database and drawing package used for mapping and resource management.

**(4) Communications software**

Electronic data transfer between computers is becoming more commonplace. Connections are made by a special cable linking the computer to a network or a telephone line. Special purpose software is used to ensure that data is sent and received properly. Such remote connections are used for searching external databases, data transfer and electronic mail.

**(5) Planning and prediction packages**

This broad category covers software that aids in decision making and performance monitoring and includes:

- Project Management - The coordination of tasks, resources and timing for planing and tracking complex projects.
- Modelling and Simulation - Creation of mathematical representations of business functions which can be used to identify trends, try out different scenarios and make predictions over time. Eg: pasture usage, animal growth, cashflow analysis.
- Optimisation - Calculation of the best mix of inputs to maximise profits or minimise costs. Eg: feed mix, transportation costs.
- Expert systems - A system built on knowledge of experts in a field. The system acts as a computerised advisor. Eg: medical diagnosis, plant identification.

**MATCHING SOFTWARE TO INFORMATION NEEDS**

Software from the above list meet information needs at one or more of the IS levels. Spreadsheets are one of the most versatile pieces of software and can be used at all three levels, eg in OS for data recording of stock lists, accounts; in MIS for reports that summarise expenses, compare actual to budget figures; and in DSS to create budget models, play "what-if" by

changing inputs and developing different scenarios (eg what if the price structure changes)?

Spreadsheets are generally not the most efficient method to record OS data but they can be used in this way. DSS usage is clearly the most valuable for long term decision making and is an area in which spreadsheets excel.

Figure 2 shows a mapping of some of the software mentioned onto the various IS levels. It is clear is that no single piece of software can meet all the information needs of an enterprise.

Because different software meets different needs, it is important that data can be moved freely between packages. For example, accounting data should be available in summarised form to a spreadsheet to allow "what-if" modelling, and tax calculations should be able to be sent via a communications package to an accountant or the IRD.

Integration of data between systems will become increasingly important as more sophisticated and specialised software is produced. It is becoming more common for software developers to provide simple methods to exchange data between their packages and other systems. Easy integration is the key to getting the maximum value from the data a business collects.

**SUMMARY**

Businesses have a variety of information needs that can be met through the use of computers. However it is important to consider the different levels of management decision making and the types of information each requires. Full advantage of a computer can only be taken if data from day to day transactions are available to support monitoring and forward planning.

There is a wide variety of software packages designed to meet specific information needs. Different packages provide information in different ways for different types of decisions. However, no one software package can meet all the information requirements of an organisation. Integration of data between packages is essential to obtain maximum value from an information system.

**REFERENCES**

O'Brien, J.A. 1990. Management Information Systems, A Managerial End User Perspective, Irwin Press.  
 Parker, C.S. 1989. Management Information Systems: Strategy and Action, McGraw-Hill.

**FIGURE 2** Fit between IS level and software packages

Software Package	IS Categories		
	Operational	Management Information	Decision Support
Accounting System	■	■	
Word Processing	■		
Spreadsheet	▨	■	■
Database	■	■	▨
Modelling/Simulation		▨	■
Expert System		■	▨
Special Purpose Packages	?	?	?

Good Fit
  Partial Fit