

unmodified problem of the example considered. The results of Table 8 show that the single heap method performs better with the modified problem than the separate heaps method performs with the modified problem and also better than the single heap method performs with the unmodified problem. Also, the separate heaps method performs better with the unmodified problem than with the modified problem.

7. CONCLUSIONS

Other researchers seem to prefer the B-trees (for both 'speed' and 'space') to any other kind of self-balancing trees, because of their high performance. It appears from studying 2-3 trees (which are a special case of B-trees) that they can be used for implementing flexible arrays as an initial indicator for more complex combinations than could be possible with general B-trees. Either 2-3 trees or more general B-trees could theoretically be used to implement flexible arrays. Which order of B-trees is best is not obvious without experiment and even considering

2-3 trees alone the option of whether to use 'single heap' or 'separate heaps' is still open since it is not obvious without experiment which is better.

The factor of complexity attributable to the depths of a 2-3 Tree was measured by comparing the total number of calls of the most important routine calls with the total number of inner recursive calls. The results indicate a factor between 1.88 and 4.13 for the example considered and perhaps 4 for otherwise similar examples with a more significant proportion of pop and extend operations.

The significance of whether a 'single heap' or 'separate heaps' are used depends on how many of the operations are pops or extends. With the popping and extending alone, processing with separate heaps costs about twice that for 'single heap' (Tables 6 and 7); other operations take the same time. Processing with the 'separate heaps' is therefore significantly slower than the 'single heap' and only if the number of extending and popping operations is a significant proportion of the total number of operations.

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Book Review

KPMG Staff

KPMG Direction of Financial Software
Information and Technology Publishing Co.
Ltd, 1991, £19.95
1-873-081022

This directory claims 'to make the business of shortlisting and selection of suitable accounting software as easy as is possible from what can seem a bewildering range of packages currently on the market' and it does just that. Of course you can never choose a package by reference to this directory alone. Seeing the package in operation, testing it with some dummy (but realistic) data, site visits and so on are all essential as well as the prior stage of examining the detailed literature carefully.

The directory does allow you to make a shortlist for detailed subsequent investigations. The directory is organised into a collection of introductory articles, a list of tables providing summarised features of packages and a list of the packages with brief descriptions. But there are several very useful cross-directories at the end, and this covers most of the ways anyone is likely to need to

look up packages - by machine type, operating system, supplier name and so on.

The basic directory with the 'at a glance' tables of summary features and brief description of packages is organised into sections dealing with: PC packages, Minicomputers (basically defined as UNIX, Wang, A5/400, VAX, PICK, HP3000, DRS-type systems), Mainframe packages (which also include UNIX, PICK, VAX packages as well as the IBM systems) and finally a section on financial planning. This is a catch-all and therefore includes a few rather oddly placed vertical market applications such as Hotel Management, but the common theme appears to be cost-related rather than purely planning (but there is a small section on spreadsheets and financial modelling).

Supplier information includes stability factors (e.g. turnover, date established) as well as support (number of support staff, etc.). Package information includes details of hardware and operating systems that various packages run on. Wherever possible the guide gives number of users of each package. Full supplier contact details are provided.

In brief this book satisfies the basic package

assessment areas very well. It is a vital tool for most practising accountants, auditors, consultants, and computer professionals. However, the package section might seem slightly daunting to the first-time buyer.

Is it complete? The directory has been compiled from a questionnaire sent out and is only based on actual replies. It therefore runs the risk of omission. I only found one; in all respects it seems very comprehensive. Sometimes omissions may be illusory (i.e. name of company changes because of takeover: for example MSA are now included under Dun & Bradstreet software and the financial systems are now called the Millennium Series, and this title covers all hardware/operating systems).

Congratulations to KPMG. Not surprisingly the directory did include several plugs for KPMG consultancy services, but unlike some other directories it is not overcrowded with advertisements. I only wish that all copies were free, but the price (£19.95) is well worth it for those who cannot persuade KPMG to give out a free copy.

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