And so, **to beds**

Stephen Wells passes on a reader's spreadsheet which calculates the availability (or lack), of NHS beds which demonstrates how easy it is to create your own Excel Function. Plus more on financial analysis.

Skimming back through my archives, I see that it's been about every five years that I've sprung for a new computer.

January '77 was the first. It was a COMPAL, from Computer Power & Light, with 16Kb of RAM. All the software was fed in from a cassette recorder. Spreadsheets hadn't been invented and I used to write accounting programs in BASIC. Most functions could be created using IF statements and GOTO subroutines.

Three computers later, in January '91, I bought a Viglen Genie 386SX with 2Mb

Fig 1 *Layout of worksheet using a new function to calculate Occupied Bed Days*

of RAM and a 40Mb hard disk. I've run every imaginable spreadsheet on this machine, though version 4 of both Excel and Lotus 1-2-3 for Windows are desperately dependent on the swop file. There is no way that it will load Excel 7, and my five years are up again. For what happened next, see *"Christmas wishes"* (below).

Bed scores
What with all the talk about the unavailability of NHS beds on the wards, you'd think there would be a spreadsheet

function for calculating that. Thanks to Neil Bain of West Sussex there is. He writes:

"I work in the health service with long-stay patients. We are asked to monitor Occupied Bed Days."

"This involves downloading patient details and calculating how many days in each month they were using a bed. Prior to creating a User Defined Function, the table contained a formula which checked to see if the patients overlapped the month in question and if so, how many days in the month were involved. This required multiple-nested IF statements. I have reduced the individual formulas to OBD(Episode_Start,Episode_End,OBD_Month)." Neil's worksheet is shown in *Fig 1*.

I assume Neil is using Excel 5, because he provided a VBA listing (Visual Basic for Applications). As I know from my mailbag that many readers use Excel 4, and as an Excel 4 macro can be used in later versions, I've rewritten his contribution, see *Fig 2*. But Neil deserves a £20 book token for his effort, which gives me the opportunity to demonstrate how easy it is to create your own Excel Function.

To make an example, enter the worksheet in *Fig 1*. The first month to be

analysed is entered here in cell four, then dragged to I4 and formatted, mmm-yy. Then highlight this range C4:I4, choose Formula, Define Name and call it Obdm.

The range A5:B8 is formatted, d/m/yy. Then the A column block is named Start, and the B column block, End. These are the dates on which the patient enters and leaves. Incidentally, for administrative purposes the day of arrival (entered in column A) is included as a Bed Day and the day he or she leaves (entered in column B) isn't.

Enter the titles and totals. Save this file as BEDDAYS.XLS, then Open a new file, choosing Macro Sheet. Make the entries shown in *Fig 2*. Save this as BEDDAYS.XLM.

I've called the new Function, "BedDays" and its arguments Start, End and Obdm. This means it looks at the Names which are the same as its arguments and calculates the Occupied Bed Days.

Neil did all the work. The Function looks at the patient's dates of entry and departure, checks whether he or she had arrived in the month above, and if so, how many days of that month the they were there.

To make a listed Function, put the cursor in cell A2 of the macro, choose Formula, Define Name. The cell reference and the new Function Name are entered automatically. Just click the Function option and Add — and the job's done.

Now you can switch over to the worksheet (press Ctrl+F6) and go to cell C5. Then choose Formula, Paste Function, and you'll find your new Function, BedDays, both in the All listing and under a new category, User Defined. Select it and press enter, twice. If you follow the example given, you should see 28 in C5. If

Fig 2

Listing for the macro which creates the BedDays function:

```
 2 BedDays                                Function
 3 =RESULT(1)                            Answer is a number
 4 =ARGUMENT("Start",1)    Episode start date    Defines
 5 =ARGUMENT("End",1)      Episode end date      arguments
 6 =ARGUMENT("Obdm",1)     Particular month
 7 OBD=0                                 Zero out answer
 8 MS=DATE(YEAR(Obdm),MONTH(Obdm),1)        Day 1 of month
 9 =IF(MONTH(Obdm)<>12)
10 ME=DATE(YEAR(Obdm),MONTH(Obdm)+1,1)-1      Last day of month
11 =ELSE()
12 ME=DATE(YEAR(Obdm)+1,1,1)-1          If last month of year
13 =END.IF()
14 =IF(Start>MS)                        Choose start date
15 OBDS=Start
16 =ELSE()
17 OBDS=MS
18 =END.IF()
19 =IF(End<ME)                          Choose end date
20 OBDE=End
21 =ELSE()
22 OBDE=ME+1
23 =END.IF()
24 =IF(OR(End<MS,Start>=ME))            Calculate bed days
25 OBD=06 =ELSE()
27 OBD=OBDE-OBDS
28 =END.IF()
29 =RETURN(OBD)                         Go to worksheet
```

you don't, switch back to the macro and press Ctrl+` (the key to the left of numeral 1). In every working cell of the macro, from A3 down to A29, you should see the word, TRUE. If you don't, something has been entered incorrectly.

Once you see 28 in cell C5 of the worksheet, drag that entry across the full range to I8. You should now show the other results given in *Fig 1*.

A happy new year

David Carpenter of Norbury is asking for a macro to make a column-moving change, so that a new year's data can be added. Personally, I'd save any five-year financial analyses you've made, with hard copies and on disk. Then I'd make another five-year form. As it's so easy, and you only need do it once a year, it hardly seems worth writing and debugging a macro.

Let's use the template David was interested in; the one for service companies. To change all the dates, just change the most recent year in cell B1, then all the dates in rows 1, 34, 68, 76 and 83 will correct themselves. Then copy and paste the Accounts Receivable (debtors) figure from F4 to G4. Copy the block B3:E28 temporarily to the block starting H3. Clear the entry range, C3:F28. Then copy and paste the temporary block H3:K28 back (into

EXCELent shortcuts and longshots

- BACK UP   Choose Save As, Options and check Create Backup File. Then at each Save the older version will be saved under the file name with a .BAK extension.
- CHECK UP   To see details of your Excel setup and its environment, run the macro, CHECKUP.XLM in the excel\library\checkup directory.
- COCK UP   If you get in a complete muddle, save your work under another name then open the last version again.
- DOUBLE UP   Many Excel icons serve double duty. Hold the Shift key when you click on them and they change their picture and their actions. For example, the Print icon changes to the Print Preview icon.
- OPEN UP   Press Alt Gr + F1 (or Ctrl + F11) to open a new macro sheet.
- SPEED UP   With a large workbook, choose Options, Calculation, Manual (instead of the default, Automatic). You can still check the Recalculate Before Save button. At other times, recalculate with F9 (or Ctrl + =).

C3:F28). Now everything's set and ready to enter the new year's figures in column B.

Financial analysis

This month I'm looking at the profitability ratios for service companies.

The results produced from the example figures of an advertising agency which we have been using are shown in *Fig 3*. A listing for the four ratios is shown in *Fig 4*. Column B is replicated across to column F. Column G has manually-entered industry averages.

I would restate that the ratios produced by this template should be examined for trends and also compared with others in the same industry, if available.

Referral to a high ratio here means that it is higher than the median ratio for the industry, or a trend to a higher ratio over the five years of the business's activities. A low ratio means lower than average for the industry or the business.

The Operating Ratio can be defined as that portion of the Commissions and Fees income remaining after overheads have been deducted. Interest charges and taxes on company income are excluded, since rates for these two items are beyond the control of management. It is a good gauge of management's competence in controlling costs.

To summarise: £1 less this ratio shows the number of pence taken to generate £1 of sales. That means that if this ratio is 15.93 percent (see cell B61 in *Fig 3*) then it's taking 84.07 pence to make a £ of sales. It also means that 84.07 pence of each sales £ was absorbed by the operations of the company.

Profit Margin is the best-known ratio, comparing Net Income with Commissions and Fees. A high percentage over the years shows that the company has learnt how to withstand adverse conditions like reduction of charges, rising costs or declining sales. Any one of these setbacks can occur, but good managers will take the actions necessary to protect the bottom line and maintain profit margins.

If this ratio is lower than or inconsistent with, the industry average, there will be less profit to pay out in dividends to the owners and to invest for the future.

However, the value of sales and total capital employed must also be taken into consideration. A low rate of return, accompanied by a large sales volume may produce satisfactory results.

Don't think this is a foolproof yardstick — it's only one measure of the profitability of a business. It does however, incidate the effectiveness of management and operation's efficiency.

A high percentage Return on Assets suggests that management is using the company's assets efficiently. A low return may indicate that the company is not being run as well as it should be.

To summarise: The ratio measures the profitability of the company expressed as a rate of return on total investments by both the stockholders and creditors. It shows the number of pence being earned by the company for every pound invested by both interests.

A high Return on Equity indicates that the company offers a good investment for stockholders and that the owners are getting a fair compensation for their risk.

If the Return on Equity is below that of other companies in the industry, you might want to look into the factors behind this. New policies may be required which will either raise charges or reduce costs.

Increased sales of more profitable services or reduction of overheads — or both — can help to raise the return.

The Return on Equity is a measure of the owners', partners' or stockholders' rate of return on their investments. It is the "yield" or "interest rate" that the business is earning.

If you've sent for the template on disk, you'll find that (ignoring the list of Names at the end) it continues to row 88. The remaining rows offer you the opportunity to make three more charts which don't illustrate ratios. They show the company's five-year report of Assets; Debt and Equity; and Costs, Expenses and Income.

Christmas wishes

Last year, I asked Santa for "a Pentium 90 with all the trimmings, like loads of memory, a CD-ROM and a fax card" which now, a year later, is pretty standard. As time passed and Santa didn't oblige, a month ago I ordered the system from one of the best known direct suppliers, and yesterday UPS delivered it to my door.

Ironically, the hold up had been that they were waiting for fax/modem cards. Whatever next — Marks and Sparks running out of knickers? Maybe so many people want to get on the internet that the world is suffering a modem shortage?

I'm reluctant to tell you the supplier's name (although I'm overjoyed with my new system) as you will think that I got a discount. To maintain my integrity and —more to the point — because they laughed when I asked, I didn't. But who cares? This dream machine is faster, cooler, quieter than my previous rig. The documentation is excellent. Everything was set up and ready to go. With no experience of comms, I signed up to the MS Network with a local connection from the keyboard.

This year Santa? I'm content. But you're welcome to drop in for a sherry.

Fig 4

Listing for the profitability ratios section of the financial analysis template

```
A60 PROFITABILITY (%)
A61 Operating Ratio
B61 =Operating_Profit/Commission___Fees*100
A62 Profit Margin
B62 =Net_Income/Commission___Fees*100
A63 Return on Assets
B63 =Net_Income/Total_Assets*100
A64 Return on Equity
B64 =Net_Income/Net_Worth*100
```

PCW Contacts

Stephen Wells welcomes comments on spreadsheets and solutions to be shared. Send them to PCW Editorial at the usual address or at **Stephen_Wells@msn.com.**

For the financial analysis Excel templates for service companies and those which carry stock, send a formatted 3.5in disk and a stamped, self-addressed envelope.