

Excel Project Ideas

Introduction

The first problem in tackling an Information Technology project is to come up with a suitable subject. You need to find a friend, relation, Club Secretary or Treasurer, Scout Treasurer or local business person who has a 'problem' which could be solved using Excel. It isn't necessary for them to actually use the system when you've finished it, though that would be a bonus both for them and for you.

Finding a genuine user is the first step in producing a good project. It is almost impossible to do a proper investigation, analysis and evaluation on a made-up problem, and you will not be able to get real user feedback which is helpful in improving your design and implementation and will result in a better project all round.

Keep in mind that it is better to start with a simple problem and add difficulty (advanced features) later, than select a complex problem that you may struggle to effectively solve and document in the limited time allowed.

Input-Process-Output

Always consider these factors at every stage of your report. It is common for a project to concentrate on a sexy user interface without the solution actually doing anything - functionality of input, processing, output, often taking second place to cosmetics.

Such projects with impressive front ends but little or no evidence of real data processing, will not score very highly. You should therefore look for an application in which data is input, output and processed, and clearly document these.

input, preferably on a regular basis (daily, weekly, monthly or even annually).

processed in some way (added up, summarised, averaged, sorted, filtered, consolidated, used in scenarios or Goal Seeking, linked to/from worksheets).

output in the form of a report, tables, or chart of some kind.

Using advanced features of Excel

You are unlikely to do very well if your project consists of a single worksheet containing some labels, numbers and basic formulae. As with competition diving, some marks go on 'difficulty'. Try to include at least some of the following features:

- Template creation;
- Linking of data between worksheets/workbooks;
- Lookups (looking up values from a table in one worksheet and linking to another worksheet);
- Inputting data into a dialogue box or user form and linking the data to a worksheet;
- Advanced functions (**VLOOKUP, IF, RAND, PMT, INDEX, COUNTIF**, etc);
- Form controls such as dropdown lists, combo boxes, command buttons;
- PivotTables;
- Goal Seek and Solver;
- UserForms
- "What if" scenarios;
- Customised macros, including Auto_Open, Auto_Close;
- Customising of toolbars or menu bar;
- Cell/worksheet protection;
- Data validation.

Here are some ideas to get your mind working along the right lines before you go in search of your own user!

Preparing budgets

Spreadsheets are frequently used by new companies who are devising a business plan to present to their accountant or their bank manager, perhaps in the hope of getting a start-up loan. Established companies also prepare budgets to help them plan a business strategy for the coming year. A school or college teacher or administrator may prepare a budget to see whether the school can afford to send students on a trip to France. The secretary of the Social Committee may prepare a budget to see how much to charge for the annual dinner dance.

A spreadsheet is ideal for this type of task, because it is so easy to alter a few figures and see what effect the various changes have on profits (or losses).

Project Idea 1: Prepare a budget for a school trip

This could be for any regular event. Create a blank template with headings and formulae, a front end menu, possibly a custom toolbar or menu, and customised macros to help the user get the required output.

Input: Number of pupils, cost of hiring coach, train fares, cross-channel ferry, cost of accommodation, amount each student will pay, insurance.

Processing: Profit/Loss on trip. What-if scenarios to establish effect of changing variables, goal-seek to establish break-even point.

Output: Payments made, scenario report.

Project Idea 2: Prepare an annual budget for a business

Have you any friends or family contacts who are about to start, or have recently started a new business? It could be anything from a new Training company to give computer courses, to setting up a coffee kiosk on the local commuter station or a hamburger stall at the annual County Show.

When preparing a budget to show to a Bank Manager, you need to prepare four different items:

- Opening Balance Sheet
- Profit and Loss Account
- Cash Flow Statement
- Closing Balance Sheet

To illustrate how these are set out, an example is given below of these reports for a proposed business which will deliver Computer Training courses.

Mr Pelham, who is proposing to start up the business on 1st March 1999, intends to start with an initial investment of £20,000, half of which he hopes the Bank will lend him. He has used Excel to work out the following figures to present to the Bank Manager.

The Opening Balance Sheet is set out as follows:

Opening Balance Sheet as at 1st March 1999			
Assets		Liabilities	
Cash in bank	20,000	Capital	10,000
		Bank Loan	10,000
Total	20,000		20,000

Figure 14.1: Opening Balance Sheet

Mr Pelham has worked out the income and expenditure figures for the first 4 months (better if he had done it for 6 months or even a year) based on a certain number of courses each week, an estimated number of people on each course, the charge per person and so on. All these variables are held in a separate part of the workbook, and linked via formulae in the Profit and Loss Account.

Profit and Loss Account for the period of 4 months ended 30th June 1999					
	March	April	May	June	Cumulative Total
Income - total invoiced sales	2,880	5,760	9,600	11,520	29,760
Direct costs					
Course material	-720	-1,440	-2,400	-2,880	-7,440
Salaries	-1,200	-1,800	-2,400	-2,400	-7,800
Total Direct costs	-1,920	-3,240	-4,800	-5,280	-15,240
Indirect costs					
Hardware depreciation over 2 yrs	-400	-400	-400	-400	-1,600
Marketing	-2,000	-1,500	-1,500	-1,500	-6,500
Rent, electricity etc	-600	-600	-600	-600	-2,400
Redecoration, rewiring of premises	-1,000	0	0	0	-1,000
Total indirect costs	-4,000	-2,500	-2,500	-2,500	-11,500
Less: Total costs	-5,920	-5,740	-7,300	-7,780	-26,740
Net Profit/Loss (Income - Total costs)	-3,040	20	2,300	3,740	3,020

Figure 14.2: Profit and Loss Account

You will note that in order to account for the reduction in value of computer equipment over a period of time, Mr Pelham has decided to charge the Profit and Loss Account with £400 per month. This charge is technically known as *depreciation*.

Now although Mr Pelham starts making a profit (on paper) in the second month, he may still run into difficulties if he has to pay for a lot of equipment and so on in advance, and his customers don't pay their bills on time. Many businesses which are profitable on paper go bankrupt – it's all a question of Aged Debtors, and the more Aged they are, the worse your situation is likely to be. Similarly, businesses can have a significant problem if they have too much unsaleable stock or high overheads.

Cash Flow Statement for the 4 months ended 30th June 1999					
	March	April	May	June	Cumulative Total
Actual cash received in bank	720	3,600	6,720	10,080	21,120
Actual cash paid out of bank					
Computers	-10,000	0	0	0	-10,000
Advertisements	-2,000	-1,500	-1,500	-1,500	-6,500
Rent	-1,800	0	0	-1,800	-3,600
Redecoration	-1,000	0	0	0	-1,000
Salary	-1,200	-1,800	-2,400	-2,400	-7,800
Course materials	-720	-1,440	-2,400	-2,880	-7,440
Total cash paid	-16,720	-4,740	-6,300	-8,580	-36,340
Net cash flow (Cash In-Cash Out)	-16,000	-1,140	420	1,500	-15,220
Opening bank balance	20,000	4,000	2,860	3,280	4,780
Plus or Minus net cash flow	-16,000	-1,140	420	1,500	
Closing bank balance	4,000	2,860	3,280	4,780	

Initial Investment Carry forward

This is derived from Opening Cash Balance – Net Cash Flow

Figure 14.3: The Cash Flow Statement

A *Cash Flow Statement* shows how much money Mr Pelham will actually have in the bank at the end of each month – if it's negative, the Bank could close him down at any time!

All Profit & Loss and Cash Flow Statements are based on assumptions. You have to think about these assumptions very carefully and make them as realistic as possible.

The main assumption that Mr Pelham has used is that 25% of customers will pay up front, and the rest will pay in 30 days time – if they don't pay up, the business could be in trouble! Notice that he started with £20,000, and although his business is making a profit month after month, after 4 months he only has £4,780 in the bank.

The Closing Balance Sheet shows the position after 4 months. The two sides must balance.

Closing Balance Sheet as at 30th June 1999			
Assets		Liabilities	
Cash in bank	4,780	Capital	10,000
Debtors (See Note 1 below)	8,640	Bank Loan	10,000
Rent paid in advance (See Note 2 below)	1,200	Profit and Loss Account	3,020
Stock (computers etc) (See Note 3 below)	8,400		
Total	23,020		23,020
<p>Note 1: (Debtors) Total Invoiced Sales £29,760 (from Profit and Loss Account) less Actual Total Cash Received £21,120 (from Cash Flow Statement) = £8,640.</p> <p>Note 2: (Rent paid in advance) Rent actually paid £3,600 (from Cash Flow Statement) less Rent charged £2,400 (from Profit and Loss Account) = £1,200.</p> <p>Note 3: (Stock – computers etc.) Cost of computers £10,000 (from Cash Flow Statement) less Hardware depreciation £1,600 (from Profit and Loss Account) = £8,400.</p>			

Figure 14.4: The Closing Balance Sheet

Input: Estimated expenses, salaries, number of courses, price of each course, people on each course, percentage paying on time, etc. These figures can all be held in a worksheet and referenced in the calculations.

Processing: Profit/Loss and cash balance after a period of months. Goal-seeking, What-if scenarios.

Output: Opening and Closing Balance Sheets, Profit and Loss Account, Cash Flow Statement, Scenario report.

Keeping accounts

Project Idea 3: Club Accounts system

All organisations like Sports Clubs, Scouts, small businesses making curtains or cleaning windows need to keep accounts. Basically you need to have a list of 'Nominal codes', such as (for a Scout group)

- Subscriptions
- AGM Expenses
- Camps
- Dance
- Jumble Sales
- Equipment
- Affiliation fees

and accounts such as

- Bank (Current Account)
- Bank (Deposit Account)
- Cash

Every time the Treasurer is asked for a cheque or cash, or handed cheques or cash, he/she makes a double entry in an accounts book, showing which account is to be credited (e.g. Jumble if the money came from Jumble Sale profits) and which account is to be debited (e.g. Cash if the money came in cash). You must be able to make transfers between Bank Accounts, and you must be able to add new Nominal Codes.

You would need to consult a Club Treasurer to find out more details!

Input: Nominal codes, opening balances, transactions.

Processing: Preparation of annual accounts using, perhaps, consolidation or PivotTable report. Clearing down at the end of the year and transferring balances ready for next year.

Output: Annual accounts.

You would do well to have a look at an Accounts package such as Sage Sterling before you embark on this, because you may decide this is a more suitable package. If you decide to go ahead in Excel you will get an idea of how an accounts system works.

Expenses claims forms

Project Idea 4: Travel claims system

Another common use for a spreadsheet is keeping track of expenses. What follows is an example specification given to me by a friend who works for B.T.

Travel claims specification

Employees of a large company have to record details of their journeys so that they can reclaim the costs involved. For each claim, they need to record the date, details, an account code against which the expense is reclaimed, the mileage travelled and the resultant cost claimed and other costs, which are hotel bills, food bills, train fares, parking costs and "other". "Other" costs must have a code associated with them.

The initial version of the spreadsheet should simply tabulate all these. Totals should be added at the bottom of each relevant column, plus total per line and overall total. The next step is to calculate mileage costs from miles travelled (using a fixed cell location for the rate per mile). Next is to track claims made/paid/yet to be sent (this will allow data filters to be set so we can print out only those yet to be sent – subtotal can also be introduced). After that I'd look at using a form to input the data. I do this using Data Form so that my formula for mileage costs is copied down the "database". After that you could introduce pivot tables to summarise claim values against account codes. For me, the *pièce de résistance* would be to summarise miles travelled by the month in which the journey was made and draw a graph of that. This can be put on the same graph as "expected" miles, which would assume an annual mileage of 2500 (a tax break). Users can therefore see whether they are doing enough company miles. (I do this with database formulae, although pivot tables could be used.) The key "presentational" aspect is to avoid zeros messing up the graphs – it's necessary to ensure that months in the future have no graph point associated with them.

Input: Details of journey, name/employee ID.

Processing: PivotTables to summarise data, charts, tracking claims made/paid/yet to be sent.

Output: Total expenses per journey per employee, total weekly/monthly/annual company expenses, monthly miles travelled by an employee, etc

This spec is not 100% clear, nor is it intended to be. You need a real user with a similar problem if you want to use this idea!

Competition results and league tables

Project Idea 5: Club league results and tables

For the majority of competitive sporting events there is need to keep records of scores, and usually a requirement to convert these into tables identifying leading competitors/teams, or those in the relegation/promotion zone.

Data in these systems is often unnecessarily duplicated - teams/competitors in tables and fixtures (often more than once), entries in tables (played, won, lost, points, etc) derived from results entered. In common with many solutions, the point of automating this system would be to save the user time and minimize risk of input error (which could be costly if the wrong team was promoted or the wrong cup winner declared). The spreadsheet should therefore be designed so that teams/competitors are entered once only (linked to other locations), and tables automatically updated (linked and converted using formulae and functions) from scores entered.

It is usually the League Secretary or competition organiser who has access to appropriate details. Whatever the sport or problem (seasonal league competition or a one-off event) a number of elements will be common.

- Input:** Team/Player names, fixtures (both input once only), match results (input following each round/week)
- Processing:** Link results to tables (or positions), convert results to tables criteria (played, won, lost, for, against, points), sort tables. Clearing down at the end of the season/competition, and archiving final tables/positions.
- Output:** League tables.

In considering the solution to this problem, the quality of the output - whether via VDU or printer - may be an issue. The user may wish to see all details on screen without the need to scroll, hardware specification should therefore refer to screen resolution. Though you (and the user) may wish to utilise colour on screen for aesthetic and working purposes, the user may not wish to print in colour (even if he/she does have a colour printer), you should therefore consider specifying print area and setting printing to b&w.

Invoicing and sales summaries

Project Idea 6: Invoicing and sales system

Someone running a small business such as making dresses, curtains, Christmas and Birthday cards, printing T-shirts or anything along these lines, may like to have a system which allows them to create and print out an invoice, and then have the invoice details added to a database from which monthly and annual sales summaries can be produced. The sample project at the end of this section does something rather similar although it is specific to a particular user, as indeed your project should be. (The sample project does not create invoices – it uses invoices created in an Accounts package as input documents.)

- Input:** Invoice details.
- Processing:** Add invoice figures to year-to-date database of sales. Use PivotTable reports to calculate summary data.
- Output:** Invoices, weekly/monthly/annual sales summaries.

Sales and stock control systems

Project Idea 7: Keep track of sales purchase and stock levels.

Businesses similar to those above may also wish to keep track of daily/weekly/monthly sales and to keep an eye on stock levels. What you should consider is that stock is derived from purchases and sales.

$$\text{Stock} = \text{Purchases} - \text{Sales}$$

If you have a 'Sales' worksheet and a 'Purchases' worksheet, the 'Stock' worksheet should be updated automatically from the accumulated sales and purchases.

- Input:** Product details, sales details, purchase details (may be via User or Data Forms), minimum stock levels.
- Processing:** Calculate stock from linked sales and purchases data, generate warning when stock falls below minimum level, clear down at the end of the year.
- Output:** Sales, purchase and stock details, maybe chart identifying best/worst selling products.

Quotation systems

Project Idea 8: Produce a quotation for a job – e.g. Tree-felling, re-upholstering, loose chair covers, curtains, catering for a dinner party or building a conservatory.

Input: Job details.

Processing: Calculate costs, add profit margin, calculate quote.

Output: Printed quotation.

Another idea falling into this category might be the calculation of the price of a new car or computer, depending on the extras required. As well as (or instead of) calculating the price you could calculate loan repayments.

Student grades system

Project Idea 9: Keep track of student grades

Many college lecturers use a spreadsheet to record marks for the classes they teach, so that they can produce neat lists on demand for visiting moderators and exam boards. They can also easily pick out recalcitrant students and write stiff memos to their tutors or letters to parents. They can calculate average marks quickly to put on termly reports, and assign a grade A-E, N, U depending on the mark. There is really quite a lot of scope in this idea if you can prevail upon your teacher to act as your own personal user. Maybe you have a parent or friend of the family who could use such a spreadsheet.

Input: Student names and marks. (Student names might be obtained from the College SIMS system as a .csv file.)

Processing: Calculate totals, averages and grades, pick out failing or brilliant students, goal seeking to calculate marks required to pass, etc

Output: Class list, individual student report, list of failing students.

Inappropriate projects

Finally, here's some advice on what *not* to choose.

- Payroll, which is a very complex business and, unless you have first-hand experience of a payroll system, best avoided;
- Any inclusion of wage details (unless you are familiar with taxation and National Insurance contributions).
- One-off problems such as one week's expenses for a Youth Club;
- Problems with too much scope such as an attempt to computerise an entire major business, taking in stock control, ordering, invoicing, paying suppliers, payroll and so on;
- Essays comparing different software or describing how to customise and install software.
- Projects which would be better tackled using other software, e.g. a database type of project.

Majority of project ideas adapted from "Successful IT Project in Excel" by P.M Heathcote. Both reference and loan copies held in the LRC.

Edexcel Syllabus extract for Task 1

General

Differentiation is one of the major problems with regard to the assessment of coursework because of the need to distinguish between good work that is based upon an exacting task as compared with good work based upon a less demanding task.

To help teacher examiners and moderators the assessment guidance gives three mark ranges to correspond to what may be considered as a foundation task (F), an intermediate task (I) and a higher task (H).

Some points that must be stressed:

The teacher examiner will have to exercise judgement as to what level of task the candidate has attempted.

The problem chosen should be realistic and realisable from the candidate's point of view.

The three columns of mark ranges below must be considered as guidelines and not definitive. (It is quite possible that a candidate has implemented well a difficult task and been correctly given 8 marks for Implementation but the User Documentation was poor and worth just 1 mark. Alternatively a perfect Design of middle of the road task is unlikely to be worth more than 6 marks.)

The Assessment Criteria given below are an indication of what is required to award the highest mark within a column range. For example:

"Description of the complete data requirements of the proposed system and indications of the sources of these data."

This would mean one thing for a comprehensive information capture and analysis task that results in the decision of the purchase of IT equipment for an art studio and quite another for a system that records the profile of newspapers taken by a specific group with some elementary analysis.

There are many ways in which a particular candidate could fall short of the ideal and this is another area where the teacher examiner will have to exercise judgement.

Nature of the Task

As stated earlier in this syllabus Task 1 will consist of:

A practical documented IT solution to a significant problem that focuses on one of the areas of

- Modelling
- Communications
- Modern User Interface
- Multimedia
- Data Logging involving significant file processing
- Database manipulation.

It is expected that such a task will involve the advanced use of one or more commercial/industrial standard application generators. In general, it will not be expected for candidates to employ programming skills.

Candidates will want to use the best software to which they have access in a manner that is most appropriate to the task in hand thus it is the intention that the following marking guidelines could be applied to most situations.

Candidates will be expected to produce documented evidence under the specified ten sections.

Marking of Task 1

Section	Assessment Criteria	Mark Ranges		
		F	I	H
Specification	Clear description of the task to be attempted. Particular references to potential users and the type of processing that will be required. Statements that justify an IT approach to the task and some consideration as to possible wider implications.	0-3	3-6	6-9
Facilities	Discussion of the suitability of specific hardware and software required as they relate to the demands of the task in hand.	0-1	1-2	2-3

Marking of Task 1 (cont.)

Section	Assessment Criteria	Mark Ranges		
		F	I	H
Analysis	Evidence that a thorough investigation of the background to the task has taken place in relationship to the potential users of the product. This should include, where appropriate, an analysis of any existing systems that are to be replaced and indications of from where the evidence has been gathered. Description of the complete data requirements of the proposed system and indications of the sources of these data.	0-3	3-6	6-9
Design	Top view of the proposed system showing the sources of the information, the information flow paths, the general nature of the processing required related to appropriate application generators and any remedial process that may be built in (data validation). Complete designs of all proposed input and output interfaces. For example, screen designs, report structures, of input signals if a real time application. Complete designs of any required processing structures. For example file structures, database structures, spreadsheet functions, hypertext connections, OLE sources and destinations.	0-3	3-6	6-9
Implementation	Detailed evidence of the implementation of the design. It is important that the relationship between the design and the implementation is clear and this may include reporting any iteration between design and implementation that often takes place.(prototyping) It could be an advantage to implement a system in a modular fashion and ensure that the documentation reflects this approach as it may assist in the awarding of deserved marks. Annotated hard copy should be produced where appropriate.	0-3	3-6	6-9
Testing	It is good practice to perform technical testing as integral with implementation. Nevertheless to help candidates maximise credit for testing it is sensible for them to give evidence, in a separate section, of what tests they have designed and tried out, including evidence of results, that show that the components of their implementation work as expected.	0-3	3-6	6-9
Documentation for the Systems Administrator	Documents that will assist a Systems Administrator install, test and troubleshoot the implemented system.	0-1	1-2	2-3
Documentation for the User	The candidate will have to demonstrate that they appreciate what is likely to be understandable to a potential user. They should use suitable software to produce an attractive guide to their product.	0-1	1-2	2-3
User Training Needs	Statements concerning any prior knowledge and skills the user may require. A helpful walk through example of using the system. A simple self-evaluation test for the user.	0-1	1-2	2-3
Evaluation	Reflective statements on how the final system meets the expectations of the specification with reference to reported reactions of users of the system.	0-1	1-2	2-3
	T1	0-20	20-40	40-60