

A Data Interrogation Tool in Excel

Written by: Brad Payne, RSS Centre for Statistical Education Email: bradley.payne@ntu.ac.uk

Have you ever wanted to create a computer tool that interrogates a database and generates meaningful charts and summaries which are concise, easily interpreted by a non-expert and simple to incorporate into a report or presentation? Would you like the data to be interrogated based on a user specified profile and the results reported as an Excel chart?

If so this article will be of interest to you. Learn what can be achieved by creating an customised application within Excel using Visual Basic routines without getting caught up in the technical aspects of programming.

Background

The impetus for the development of an interrogation tool resulted from the need of Pf, our clients, to investigate survey data. Pf produce a monthly journal providing up-to-date news for sales people working in the pharmaceutical and healthcare industry. Our objective was to develop a tool that would enable investigation of their survey data collected from sales people throughout the industry. In particular the following benchmarks were sought:

- Actual salary, bonus and remuneration packages
- Motivational values in working for an organisation
- How companies fare in motivating their field force
- The most desirable organisations to work for

The tool was to be made available to customers of Pf who need to investigate the views and perception of their employees and to discover how their company compares to the industry benchmark. Since the actual data collected is confidential, security measures are incorporated to ensure the user of the tool could not access the raw data.

Throughout this article, to ensure confidentiality, the pharmaceutical companies that participated in the survey are not identified but are referred to as Company X and Company Y.

The Interrogation tool

The clients, Pf, had a minimal budget to develop the tool, and thus suggested using Excel as the basis of it, in light of its wide availability in the sales force and its reporting capabilities. Although Excel is used to provide the framework for the tool ie. producing charts etc, the user is restricted to specific controls. The Excel toolbar has been removed, all data, sheets and code are restricted and protected, and the options available are specific to interrogation of the database. All results are reported visually, however, there is the facility to copy charts to the clipboard and thus enable results to be included in packages such as Word or PowerPoint.

The questionnaire is split into several sections:- About

You, Remuneration, Motivational Values, Company Perception and Recruitment. The 'About You' section captures vital information regarding the profile of the individual including which company they work for, how old they are, how much experience and training they have, and the nature of their work. Such information allows the data in the other sections to be benchmarked and enables meaningful investigations. For the profile categories used in the survey there are over 1.7 billion possible combinations that can be interrogated. Not all would be of interest, but a tool is needed which enables the user to select a profile of interest and examine summary results of the associated data.

The Profile Selector

The profile selector (Fig 1) helps the user to create a profile which is used to cut matching data from the entire database. This enables a particular cross-section of the medical sales force data to be interrogated which in turn allows comparisons. For example, responses of each individual age group can be examined, or responses of people with different job roles compared. Questions of interest can be answered, such as; are younger employees more satisfied with their current employer compared to older employees? What are important work factors to sales people performing a particular role? Are these work factors different for different roles?

Fig 1 Profile Selection screen of the Interrogation Tool

Companies are interested in how their company compares to the overall industry, and where they are relative to their main competitors. However, it was essential to ensure the confidentiality of the selected

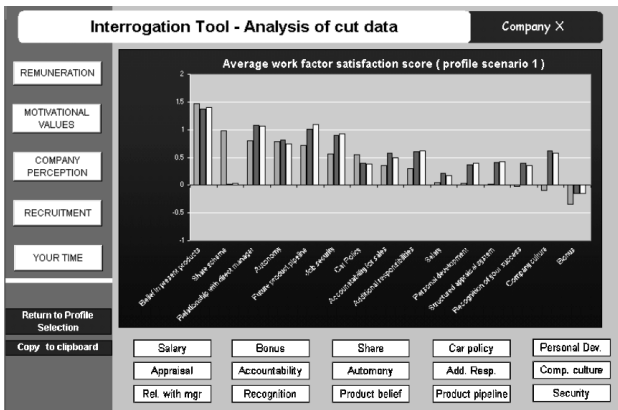


Fig 2 Menu-driven analysis screen with graphical output

companies. To achieve this the user of the interrogation tool has to select at least four other companies from the reduced list of 35. Once a profile has been created and the companies of interest selected the data may be cut and the results examined using the analysis menu.

Analysis of the cut data

The cut data is comprised of three different sets.

- Own company data matching the selected profile
- All companies matching the selected profile
- At least 4 other companies matching the selected profile

To facilitate the analysis of the cut data a menu-driven environment has been developed. In addition, to ensure familiarity and ease of use, the section headings of the survey are the control buttons. When selected they display a drop-down list of related topics. For ease of interpretation most results are reported graphically with summary statistics reported for quantitative data. Extra features developed to aid interpretation and reporting include the option to give the profile selection a name which is then used in the title of the graphs. Another option is to copy the displayed graph for inclusion in Word reports or PowerPoint presentations.

An example of the analysis screen

Fig 2 is a snapshot of the analysis screen displaying the work factors ranked according to the satisfaction score of the own company data. For a given work factor the bars from left to right represent own data, profile data, and company selection data. This can prove very insightful. For example, in Fig 2, each data group is most satisfied with their belief in the present pharmaceutical products and least satisfied with the bonus received. Closer examination of each work factor can also be made.

The graph in Fig 3 shows another example of how own company data can be displayed. It shows that, compared to the profile and company selection, Company X has a greater proportion of the respondents that are satisfied with the company share scheme.

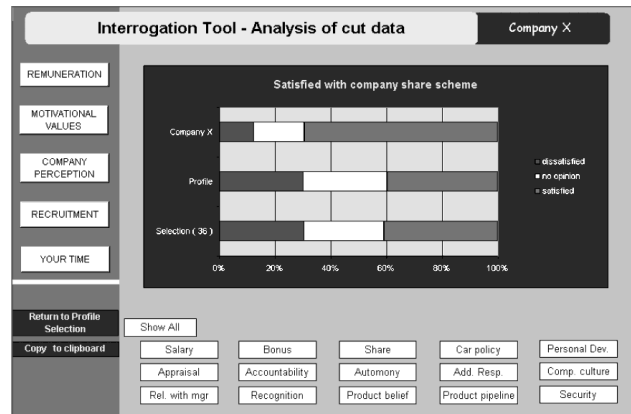


Fig 3 Example graphical output

Where appropriate summary statistics are displayed for quantitative data. For example the number of days off are reported by summary statistics and the average value reported graphically (Fig 4).

Discussion of the interrogation tool

The Interrogation tool provides the facility for a non-data management specialist to add value to a data set which conventionally would be limited in usefulness. The power of the tool is the data selection flexibility together with the ability to generate readable results that may be transferred to Microsoft applications. An improvement currently being developed is the incorporation of statistical tests to detect significant differences between the three different sets of own company data, profile data and selected companies. This, together with the graphical output, will aid correct interpretation. Furthermore we anticipate that a data interrogation tool can be developed to support most databases. At present the tool is written in Visual Basic using the Excel environment. The possibility of creating a web-based data interrogation tool is also being investigated.

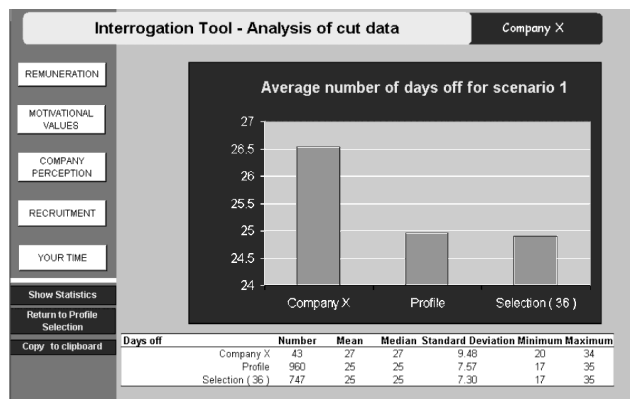


Fig 4 Example graphical output and summary statistics

Register your interest

If you would like to learn more about the tool or are interested in developing an interrogation tool for a database please contact the author via email.