The 2009 ENBIS Challenge
(Sponsored by JMP)

Developing Products and Services People Want To Buy: Visual Analytics for the Analysis of Marketing-Related Data

Acell Inc.

Introduction

Acell assembles and sells laptops in the Far East, and, in the UK, one of its primary retail outlets is PC Universe who it started to do business with in 2008. A large number of laptop configurations are assembled and sold, involving different screen sizes, hard disk sizes, memory sizes and so on. New, improved components are being introduced almost weekly, giving the chance to build new “better” configurations. Acell’s assembly and distribution costs are more or less fixed, so key determinants of profitability are the costs of the components it sources, and the price it can charge for the different configurations it markets whilst still maintaining sales volumes. Acell is also concerned with brand recognition and is subject to the usual competitive pressures. In the past it has, within some imposed guidelines, allowed retailers to discount at their own discretion in order to move product and secure market share.

This case history looks at some point of sale data from the London area in 2008, where a significant fraction of Acell’s UK sales occur. The challenge is to undertake an exploratory analysis to see what people have been buying, where, and how much they have been paying.

In the spirit of a “virtuous circle of learning”, the insights gained from this analysis could used to design an appropriate choice experiment for a consumer panel to determine which characteristics of the various configurations they actually value, thus helping determine product strategy and pricing policies that will maximise Acell’s projected revenues in 2009. This latter aspect is not part of the 2009 challenge as such.

An Outline of the Challenge

This section is an overview of what is involved in the challenge.
**The Business Objective:**

Determine product strategy and pricing policies that will maximise Acell’s projected revenues in 2009.

**Management’s Charter:**

Uncover any information in the available data that may be useful in meeting the business objective, and make specific recommendations to management that follow from this (85%). Also assess the relevance of the data provided, and suggest how Acell can make better use of data in 2010 to shape this aspect of their business strategy and operations (15%).

(The percentage figures above show the weighting that will be attached to each aspect used by the adjudicators in ranking submissions).

Note that the data provided is in three comma-delimited files:

- The point of sale data provided to Acell by PC Universe.
- The details of each laptop configuration.
- The geographic location of each London postcode.

The three files are supplied in a ZIP archive, “ENBIS_2009_Challenge_Data.zip” (size 3,509 KB).

(The data used in this challenge is both representative and stylised. Generally real-world data is more complex).

**General Remarks on the Analysis of Challenge Data**

Factors that limit our ability to successfully get value from data include, but are not limited to: The familiarity of the user with what the data actually means (the data context), the functionality of the software they choose to use (assuming pen and paper is not a viable option), and their level of knowledge and training. But the primary limiting factor, for historical data at any rate, is what variables were actually measured and on what (and how, although it can be difficult or impossible to establish this retrospectively). Therefore detailed objectives emerge as one works with the data to gain an appreciation of what questions it can (and cannot . . .) realistically be expected to help us to answer.

At a high level, your areas of exploration should fall into four somewhat overlapping categories aligned with the charter above:
Price Questions:
- a. What prices are the laptops actually selling for?
- b. Does price change with time?
- c. Are prices over retail outlets consistent?
- d. How does price change with configuration?

Location Questions:
- e. Where are the stores and customers located?
- f. Which stores are selling most?
- g. How far would customers travel to buy a laptop?

Configuration Questions:
- h. What are the details of each configuration, and how does this relate to price?
- i. Do all stores sell all configurations?

Revenue Questions:
- j. How do the sales volume in each store relate to Acell’s revenues?
- k. How does this depend on the configuration?

Note that, by definition, exploratory analysis is a little open-ended, since the goal is to generate clues about what is happening which can then open up new avenues of investigation (“hypothesis generation” rather than the more formal “hypothesis testing” featured prominently in many books on statistics). The non-linear nature of exploratory analysis, allied to the fact that different people literally “see” things differently means that the software you use should ideally be both agile and functional. Note also that, as well as being a potent weapon for exploratory analysis, dynamic visualisation can also very valuable when trying to understand and communicate the results of statistical modeling.

Your Challenge Submission

Using any software of your choice, try to unearth answers to the questions above that are relevant to the stated business objective and charter. Once you start to work with the data, you may also find you need to pose and answer new, relevant, questions.

Each submission should consist of the following:

1. A PowerPoint presentation to communicate your findings to management (maximum 5 slides).
2. A Word document that shows your findings in more detail, and also the route that you took to discover them (maximum 20 pages).

Both files should contain output generated by the software you used, and any other file types submitted will not be reviewed.
Submissions can be made by anyone, and can be uploaded at http://www.enbis.org between 6th July 2009 and 31st July 2009. Upload will require you to create an ENBIS profile if you do not already have one. As part of the upload process you will also need to answer the following questions in a web form:

- Name of software used.
- Frequency of software usage (“Several times a day”, “Several times a week”, “Several times a Month”).
A Word About JMP

As mentioned, you are free to use any software to meet the challenge.

But if you are unfamiliar with JMP, and would like to road test it, the following comments may help you. You can download a (three month) fully functional demo version via the link at [http://www.jmp.com](http://www.jmp.com).

A Word on the JMP User Interface

- (1) JMP uses blue disclosure buttons to hide and reveal things so you can make the best use of your screen area and focus on the job in hand:

- (2) JMP uses red triangle menu buttons to put commands where you need them, when you need them:

JMP is split into various “Platforms”, which generate “Reports” from a Data Table.

- Platforms use unfolding analyses rather than plan ahead dialogs so that you can be genuinely data-driven.
- Platforms use “Column Properties” to give the most appropriate Reports.
Three important points about using JMP:

- When you select a menu item (for example, Analyze > Distribution), you are presented with a dialog to launch the platform you have chosen. If you are not sure what the various column roles and options are intended to do, hit the Help key (or use the “?” tool in the toolbar) to get context-sensitive information.

- The specific output that appears in your report is determined by the JMP preferences you currently have set. These can be changed by selecting File > Preferences and then clicking on the Platform icon.

- As mentioned, JMP is very functional and nimble. Therefore you can make mistakes and learn quickly. Do not be afraid to click around in the report windows with a left or a right mouse click (the latter will usually bring up a context menu that depends on what you clicked on).