



Programme for members' meetings 2000/2001 season

17th October 2000	<p>Defending E-Business Against Malicious Attacks <i>Hackers will probe your sites, some attacks succeed. We will look at Penetration Testing, Intrusion Detection and Incident Response in action with practical case studies of how they can combine to safeguard today's e-business world.</i></p>	10.00 to 16.00
7th November 2000	<p>Securing High Availability Web Service <i>Customers want to be able to get connected at any time, anywhere, with uninterrupted service, calls that never drop, and transactions that always complete.</i></p>	16.00 for 16.30 ICAEW
13th November 2000	<p>Outsourcing and Out of Control Projects <i>About 25% of software projects will be cancelled because they are late, over budget, have unacceptably low quality, or experience some combination of these problems. Outsourced operations have created new security threats and risks. Practical control measures are vital.</i></p>	10.00 to 16.00
16th January 2001	<p>Phone Fraud <i>Telecommunications related fraud has fast become a major threat in today's world. Everyone from the largest corporation to the teenager with a mobile is at risk from attack. How can you reduce the risk?</i></p>	16.00 for 16.30
13th February 2001	<p>Implementing PKI <i>Public-key infrastructure (PKI) is the combination of software, encryption technologies and services that enable enterprises to protect the security of their communications and business transactions on the Internet. We will focus on the practical aspect of implementing PKI.</i></p>	10.00 to 16.00
15th May 2001	<p>WAP Security <i>The massive growth in the popularity of mobile phones, personal digital assistants and handheld PCs is a huge new market for anyone involved in e-commerce. We look at the security offered with WAP solutions.</i></p>	16.00 for 16.30

The late afternoon meetings are free of charge to members.

For full day briefings a modest, very competitive, charge is made to cover both lunch and a full printed delegate's pack.

Contents of the Journal

Technical Briefings		Front Cover
Editorial	John Mitchell	3
Classification of Spreadsheet Errors - Refereed Article	Kamalasen Rajalingham, David R Chadwick & Brian Knight	5
Sorting Out that Subversive Spreadsheet - (and Having a Good Time Whilst Doing So!)	David Chadwick	11
CASG Annual Meeting	Andrew Hawker	12
The Web Page Professional Bodies Concerned with Computer Audit	Andrew Hawker	13
BCS Matters!	Colin Thompson	14
Humour Page		16
Membership Application		17
Management Committee		19
Briefing and Meeting Venues		20

Editorial Panel

Editor

John Mitchell

LHS – Business Control
Tel: 01707 851454
Fax: 01707 851455
Email: john@lhscontrol.com

Academic Editor

David Chadwick

Greenwich University
Tel: 020 8331 8509
Fax: 020 8331 8665
Email: d.r.chadwick@greenwich.ac.uk

Editorial Panel

Andrew Hawker

University of Birmingham
Tel: 0121 414 6675
Email: A.Hawker@bham.ac.uk

BCS Matters

Colin Thompson

British Computer Society
Tel: 01793 417417
Fax: 01793 480270
Email: cthompson@bcs.org.uk

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Letters to the editor are welcome as are any other contributions. Please contact the appropriate person on the editorial panel.

Editorial address:

47 Grangewood,
Potters Bar
Herts, EN6 1SL

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Potters Bar, Herts
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EDITORIAL

The forthcoming merger between CASG and the ISSG will result in synergies which will be of benefit to both sides and I am looking forward to a wealth of articles on the security aspects of IT, although if they are as prolific in the production of articles as the audit side I will not hold my breath too long in anticipation!

Whilst on the subject of mergers have you considered the link between risk management and audit? As most of you know it is something close to my heart and I am now enjoying the opportunity of seeing how Turnbull is forcing most companies to consider the relationship between their corporate risk and internal audit departments. Uneasy bed fellows in

not a few cases. If risk management is a managerial responsibility and if the corporate risk department is part of that process, then it is internal audit's job to audit the risk management process and, by default, the activities of the corporate risk department. This becomes increasingly interesting when we drill down into IT governance.

Ideally, the IT department will have its own risk management process whereby key corporate risks are pushed down from above and residual operational risks are pushed up from below. Computer audit needs to review the push down/up process to ensure that key risks that affect IT are being managed and residual operational risks are being delivered to the door of the main board for consideration. This implies that the IT risk management process needs to be both formalised and trustworthy. The more trust we have in management's risk management process the less need for direct audit activity as we can use attestation, or confirmation work to test the reliability of management's assertions and representations on risk. This however, requires us to first ascertain the reliability that we can place on the overall control environment. This in itself is an interesting area and I would appreciate a few articles on the subject as it applies to IT. Any volunteers?

In this edition you will find an exposition on spreadsheet errors, which on its own is interesting, but could be developed as an indicator of the reliability of a single part of the control environment. We also have Andrew Hawker guiding us through some useful, and not so useful, web sites and Colin Thomson bringing us up to date on what's happening at the BCS. Happy reading.

On a personal note I am pleased to report that Willie List, who was for many years Chairman of this Group, has had his heart transplant and is doing well. On behalf of all who know him I extend our best wishes to him, Jennifer and the boys.

John Mitchell



ISACA LONDON CHAPTER EVENTS 2000/2001

<i>Date</i>	<i>Subject</i>	<i>Speaker</i>
21 September	IT Governance - what does it mean to the information systems auditor?	Vernon Poole
19 October	Implementing IT Governance in a multi-national plc - a practical case study	John Mitchell
16 November	Will the e-economy change strategic risks in my organisation?	Malcolm McCaig Deloitte & Touche
7 December	E-business availability	TBA
18 January	Controlling the e-developments	Charles Mansour The Woolwich
15 February	Applications to meet the e-needs - what are the risks?	TBA
15 March	Forensics in an e-world or "Who's been hacking my e-business?"	Tad Dippel KPMG
19 April	Securing the systems - what's new	Yag Kanani
17 May	The end of 'The Audit' as we know it	Gerry Penfold KPMG
21 June	Required competencies for the IT auditor in the e-business world	Sarah Blackburn Lex Services

GUIDELINES FOR POTENTIAL AUTHORS

The *Journal* publishes various types of article.

Refereed articles are academic in nature and reflect the Group's links with the BCS, which is a learned institute governed by the rules of the Privy Council. Articles of this nature will be reviewed by our academic editor prior to publication and may undergo several iterations before publication. Lengthy dissertations may be serialised.

Technical articles on any IS audit, security, or control issue are welcome. Articles of this nature will be reviewed by the editor and will usually receive minimal suggestions for change prior to publication. News and comment articles, dealing with areas of topical interest, will generally be accepted as provided, with the proviso of being edited for brevity. Book and product reviews should be discussed with the appropriate member of the editorial panel prior to submission. All submissions should either be on double spaced, single-sided A4 paper, e-mail, or on PC format diskette in Microsoft Word, Ami-Pro, or ASCII format. Electronic submission is preferred.

Submissions should be accompanied by a short biography of the author(s) and a good quality monochrome photograph, or electronic image.

Submission Deadlines

Spring Edition	7th February
Summer Edition	7th May
Autumn Edition	7th August
Winter Edition	7th November

CLASSIFICATION OF SPREADSHEET ERRORS

Kamalasen Rajalingham, David R. Chadwick & Brian Knight

University of Greenwich, United Kingdom

Email: k.rajalingham@gre.ac.uk Fax: 020 8331 8665

ABSTRACT

This paper describes a framework for a systematic classification of spreadsheet errors. This classification or taxonomy of errors is aimed at facilitating analysis and comprehension of the different types of spreadsheet errors. It is far more comprehensive than any presented or published before. The taxonomy is an outcome of a thorough investigation of the widespread problem of spreadsheet errors and an analysis of specific types of these errors. This paper also contains a clear description of the various elements and categories of the classification. It is also accompanied and supported by appropriate examples.

1. INTRODUCTION

A host of publications over two decades have clearly described the seriousness of spreadsheet errors and their adverse or potential impact on businesses. A financial model review by KPMG Management Consulting, London¹ confirms the frequency and seriousness of spreadsheet errors. Their report states that in 95% of the financial models reviewed, at least 5 errors were found. The review also reveals alarming statistics pertaining to defects in spreadsheet development, addressing the project management, technical and analysis aspects.

An article in *New Scientist*² has reported that a study conducted by the British accounting firm Coopers & Lybrand found errors in 90% of the spreadsheets audited. This is an extremely high figure and if the errors went undetected, it could have had a devastating effect on the business. It is evident from these cases that the occurrence of spreadsheet errors is a major problem for businesses and needs to be addressed urgently.

A thorough review of literature relevant to spreadsheet development and errors reveals that very little research has been done on studying specific errors that occur in spreadsheets. The outcome of a thorough analysis of specific types of spreadsheet errors from a wide variety of sources is a more comprehensive classification or taxonomy of spreadsheet errors than ever presented before. It reflects an improvement to the version of the classification presented previously by the authors.

2. THE SPREADSHEET ERROR TAXONOMY

2.1 Introduction

In a broad sense, taxonomy is the science of classification, though more strictly, it refers to the classification of living and extinct organisms. The term is derived from the Greek *taxis* ("arrangement") and *nomos* ("law"). It is important to note, however, that there is no special theory which lies behind modern taxonomic methods³.

In attempting to define taxonomy within the context of spreadsheet errors, it would be appropriate to investigate the definition of this term in other fields of study. In biology, *taxonomy* refers to the establishment of a hierarchical system of categories on the basis of presumed natural relationships among organisms. The goal of classifying is to place an organism into an already existing group or to create a new group for it, based on its resemblances to

and differences from known forms. To this end, a hierarchy of categories is recognised³.

2.2 Taxonomy of Spreadsheet Errors

Based on the definitions borrowed from other disciplines, we can extend the concept of taxonomy to include the classification of spreadsheet errors. For our purposes, the *spreadsheet error taxonomy* can be described as the hierarchical system of categories of spreadsheet errors on the basis of presumed common characteristics and relationships.

Based on the principles of classification adopted in botany and zoology, taxonomic methods for spreadsheet errors depend on:

- a) obtaining a specific type and example of a spreadsheet error
- b) comparing the error with the known range of variation of spreadsheet errors
- c) correctly identifying the error if it has been described, or preparing a description showing similarities to and differences from known categories, or, if the error is of a new type, assigning it to a new category.
- d) determining the best position for the error in the existing classifications and determining what revision the classification may require as a consequence of the new discovery

3. RATIONALE FOR DEVELOPING A SPREADSHEET ERROR TAXONOMY

There are various reasons for developing a taxonomy of spreadsheet errors. The most important probably is that it forces us to clearly understand the characteristics of an error as well as the nature of its occurrence. A comparison can also be made with other related errors belong to the same category or level.

An insight into the features and nature of an error is critical for any effort to devise a solution or method of detection. In general, a similar approach can be taken to address errors within the same category of the classification. The knowledge of the characteristics of an error also enables analysis of its potential impact and frequency. It is also highly probable that other errors in the same category would have the same degree of seriousness.

4. FRAMEWORK FOR THE CLASSIFICATION OF SPREADSHEET ERRORS

Two different approaches to the classification of spreadsheet errors were experimented. The following frameworks for the classification of spreadsheet errors appear feasible based on an examination of the process of spreadsheet development⁴ and the characteristics of spreadsheet errors and the nature of their occurrence:

- i) based on the nature and characteristics of the error
- ii) based on the spreadsheet development life cycle

Having used both frameworks, it was found that the classification based on the characteristics of the error was far more appropriate due to its structure and rigidity. The main criterion for selecting the better framework was the possibility of minimising the recurrence of the same category or type of error in different parts of the taxonomy. In other words, to minimise the overlap of different categories of spreadsheet errors.

In order to produce the taxonomy of spreadsheet errors, the *binary tree* approach is used in conjunction with the analysis of spreadsheet errors based on their nature and characteristics. At each stage of the taxonomy, this approach uses *dichotomies* or divisions into two disjunctive groups, to classify spreadsheet errors.

5. CLASSIFICATION OF SPREADSHEET ERRORS

Figure 1 shows the model of the classification of spreadsheet errors constructed by adopting the framework described in the previous section.

SYSTEM-GENERATED

System-generated errors are errors made by the spreadsheet software or bugs in the software. Their occurrence is generally beyond the control of users, although they can, when aware, take corrective action.

Example: Century Error

In MS Excel 97 for instance, for any entry of a date (without the century) before 01/01/30, the century is assumed to be the 21st century while for any entry of a date (without the century) after 01/01/30, the century is assumed to be the 20th century. This problem, of course, can be avoided if the year is explicitly entered with the century e.g. 09/02/1915, 03/12/2060 (*dd/mm/yy*)⁵.

USER-GENERATED

User-generated errors are errors committed by the user, as opposed to being software/system-generated and can be prevented, detected and corrected by the user. They can be divided into two major categories at the highest level, namely *qualitative errors* and *quantitative errors*.

QUANTITATIVE

Quantitative errors are numerical errors that lead to incorrect bottom-line values⁶.

ACCIDENTAL

Accidental errors are mistakes and slips caused by negligence, such as typing errors. Though quite frequently occurring, they have a high chance of being spotted and corrected immediately by the person committing the error. Some, however, do go undetected and could lead to incorrect values in other cells. It is important to state here that most of the errors described under this category can also be intentional or deliberately caused with malicious intent.

After a close examination of various types of accidental errors, it has been found that they can be further divided into two distinct categories. They are *developer-committed errors* and *end-user-committed errors*.

DEVELOPER-COMMITTED ERRORS

Developer-committed errors are errors produced by the developer of the spreadsheet model. These errors usually occur in the workings (as opposed to input or output) section of the model. They

can belong to any of three categories, namely omission, alteration and deletion.

OMISSION

Here, omissions are things accidentally left out of the model by the developer. Human factors research has shown that omission errors are especially dangerous, because they have low detection rates⁶. It could be that a key factor or variable is omitted from the spreadsheet model and therefore, an important relationship is missing from the model.

Example: References to corresponding input data in the workings/output section are omitted from the model.

KPMG, in one of their client models, found that increase in vehicle cost was blank until 2001, even though the source of data from that date (from another worksheet) contained values for the earlier years⁷.

ALTERATION

This error occurs when the developer of the model accidentally makes a change to an existing model, that produces a defect in the model. An example of such an error is the use of cell protection on the wrong cells accidentally, making it impossible for users to enter data⁸.

DUPLICATION

The developer of the model accidentally re-creates elements of the model, causing data duplication or redundancy.

Example: A variable is defined twice.

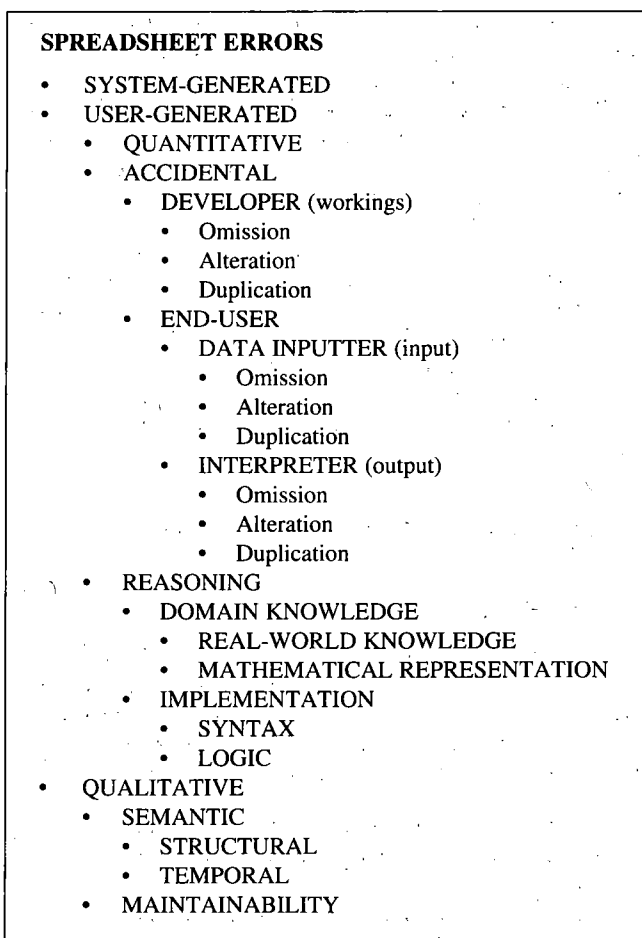


Figure 1. Taxonomy of Spreadsheet Errors

When developing a model, it's easy to make a forecast for a growth rate of X%. X is written into the equations that compute growth but is written in as a constant, for example, =[cell above] x 1.04. In a later stage of model development, the user might do a what-if analysis and writes an equation such as = [cell above] x [growth rate cell]. During debugging, the two growth rates might be identical or similar. During use, they might be different ⁹.

END-USER-COMMITTED ERRORS

End-user-committed errors are mistakes or slips made by end-users who merely manipulate or interpret the spreadsheet model/system. The end-users can consists of two distinct groups, namely the data inputters and the *data interpreters*.

DATA INPUTTER

The data inputter is the end-user who enters the data required by the model. It is these values which are fed into the workings and output sections. The data inputter may also produce errors as a result of omission, alteration or duplication of data.

OMISSION

These errors are typically caused by the data inputter who fails to enter a piece of data required by the spreadsheet model.

ALTERATION

These errors usually take the form of data input or overwriting errors. These are errors made by users while adding to or modifying existing data in the spreadsheet model.

Example: Rows are added to spreadsheets but not the "bottom line" totals.

The modeller has written an equation to find column totals, writing the equation in row seven. Data are to be entered below. The equation is written =SUM(B8:B99). It works fine until a user adds data in row 100. Because this row is beyond the range of the equation, the data is not included in the addition ⁹.

DUPLICATION

Duplication errors by data inputters are mainly caused by accidentally re-entering data in the wrong part of the spreadsheet.

DATA INTERPRETER

The data interpreter is the end-user who extracts useful information from the model and presents it in a more convenient form. This is the output section of the spreadsheet model. The data interpreter may perform various actions to obtain the desired information. In the process, they may commit errors that can be classed as either omission, alteration or duplication based.

OMISSION

The data interpreter accidentally leaves out certain elements from the output section of the model.

ALTERATION

The data interpreter may incorrectly alter the model and consequently misinterpret the results. For instance, they may sort particular columns of data in a table, accidentally leaving out the corresponding columns. This makes the table inconsistent and unreliable.

ERRORS IN REASONING

These errors involve entering the wrong formula because of a

mistake in reasoning. The formulae may be incorrect as a result of either choosing the wrong algorithm or creating the wrong formulae to implement the algorithm.

DOMAIN KNOWLEDGE

Domain knowledge errors are produced due to lack of knowledge required to analyse the business function in order to design the data model which is to be represented electronically by the spreadsheet model. These skills enable the user to identify business functions which are suitable for modelling with a spreadsheet and how this modelling is to be done. This requires thorough knowledge of business functionality and requirements for both the present and the future.

REAL-WORLD KNOWLEDGE

These errors involve creating an incorrect formula by selecting the wrong algorithm.

Example: Calculation of depreciation

The reducing balance method is used instead of the straight line method or vice versa.

Example: Absence of distinction between leap and non-leap years

For instance, year 2000 is a leap year, but calculations divide by 365 not 366 ⁸.

MATHEMATICAL REPRESENTATION

These errors involve incorrect or inaccurate construction of a formula to implement a correctly chosen algorithm.

Example: The PERCENTAGE problem

This error occurs when the formula to calculate percentage is incorrectly written, either due to lack of knowledge of what a percentage is or BODMAS (Brackets, Of, Division, Multiplication, Addition, Subtraction) by which the spreadsheet identifies precedence in calculations e.g. B2/A2*100, B2*100/A2 or B2*A2/100 instead of A2/B2*100 or A2*100/B2. This is based on figure 2 below.

A	B	C	
Night Wages £	Total Wages £	Night Wages %	1
1400.00	46940.00		2

Figure 2

IMPLEMENTATION

Implementation errors are produced due to lack of knowledge on the full use of the functions and capabilities of the particular spreadsheet package in use, with an understanding of the spreadsheet principles, concepts, constructs, reserved words and syntax. Implementation errors can be divided into *syntax* and *logic* errors.

SYNTAX ERRORS

A syntax error occurs when the formula contains characters and symbols which are not recognised by the spreadsheet software to perform the desired function. Syntax errors can be easily detected as the spreadsheet immediately indicates that an error has occurred.

	A	B	C	D	E	F
1	Lazy Days Staff Budget Costs 1995-1996					
2		Staff	Basic	Overtime	Total	Average
3		Numbers	Wages £	Wages £	Wages £	Wage £
4						
5	Managers	1	17700	0		
6	Grade 1	3	45540	1400		
7	Grade 2	9	122340	2000		
8	Grade 3	12	102350	0		
9	Grand Totals	25	287930	3400		
10						

Figure 3

LOGIC ERRORS

A logic error is a form of implementation error which occurs when the formula is incorrectly constructed due to a lack of understanding of the features and functions of the spreadsheet software in use. As a result, the formula produces a wrong value.

Example: Relative and absolute copy problem

The relative copy causes cell references in a copied formula to alter row and column references relative to the original cell copied. People often make the false assumption that the software will automatically adapt the cell references wherever they happen to copy¹⁰.

Example: Misconception of the AVERAGE function

Users see the word 'Average' in the column heading and immediately apply the average function without questioning whether it was appropriate¹⁰. Based on figure 3, Over 80% of students in a survey entered =AVERAGE(C6:D6) in cell F6. But this gives the average of *Basic Wages* and *Overtime Wages* when, given the context, surely it is the 'average wage per person' and the formula should be =E6/B6.

Example: Circular references

This error frequently occurs in totals where the formula uses its own value in its calculation. This error will give a run-time error message and so probably occurs infrequently.

A common example of a circular reference arises when calculating bank overdraft interest, and can be corrected as follows⁸:

With a circular reference, i.e., the *incorrect* way:

Cashflow	£
Opening bank balance (overdrawn)	(x)
Add: Receipts	x
Less: Payments	(x)
Less: Overdraft interest based on closing balance	(x)
Closing bank balance	(x)

Figure 4a

Each time the spreadsheet is recalculated the overdraft interest will change and update the closing bank balance *ad infinitum*.

Without a circular reference, i.e., the *correct* way:

Cashflow	£
Opening bank balance (overdrawn)	(x)
Add: Receipts	x
Less: Payments	(x)
Balance before overdraft interest	(x)
Less: Overdraft interest on balance before interest	(x)
Closing bank balance	(x)

Figure 4b

QUALITATIVE

Qualitative errors are errors that do not immediately produce incorrect numeric values but degrade the quality of the model. The model also becomes more prone to misinterpretation on the part of the user. As a result, it also becomes more difficult to update and maintain the model. A more detailed investigation into qualitative errors reveals that they can be generally divided into two different types, namely, *semantic* and *maintainability errors*.

SEMANTIC ERRORS

Semantic errors are qualitative errors that occur due to a distortion of or ambiguity in the meaning of data. It consequently leads to incorrect decisions, choices or assumptions. As far as qualitative errors are concerned, semantic errors are relatively very difficult to detect. They can be divided into *structural* and *temporal errors*.

STRUCTURAL ERRORS

These errors usually take the form of flaws in the design or layout of the model, incorrect or ambiguous headings, and situations in which the documented assumptions are not reflected in the model, causing confusion.

Example: Formatting error

If you format to one digit to the right of the decimal (F1), and then enter values having greater precision, the spreadsheet will round off the numbers. Thus 1.44 will round off to 1.4; the sum of 1.44 and 1.44 will round to 2.9 from 2.88. Such additions will appear incorrect⁹.

Example: SUM Incorrect Use Problem

A common error is to enter any formula within the SUM brackets as though the SUM was mandatory for defining a formula, for instance, in the spreadsheet model in figure x, the formula in cell H7 might be wrongly entered as =SUM(G7/D7) when it should really be =G7/D7. Although the calculation is correctly done, this is logically wrong and could cause confusion ¹⁰.

TEMPORAL ERRORS

Temporal errors are described as qualitative errors produced due to the use of data which has not been updated. They can lead to unreliable decisions or interpretation of the situation.

Example: Qualitative error resulting from the referencing of non-current Data

This is an example of a qualitative error produced as a result of referencing a piece of data that has become invalid due to time lapse. In the example given below (figure 5), this piece of data is the exchange rate from British Pounds (£) to Ringgit Malaysia (RM) contained in cell F2. If the exchange rate undergoes acute fluctuations and the changes are not reflected in cell F2, the calculation in cell A8 produces a value that is invalid. This is a qualitative error and any decision made based on this value would be unreliable.

MAINTAINABILITY

Maintainability flaws are features of the spreadsheet model that make it difficult to be updated or modified. They can potentially cause inconsistency in the model. A common and typical example of a maintainability error is hard-coding.

Example: Hard-coding

The hard-coding of a formula is another example of a qualitative, decision error. This error decreases the quality of the spreadsheet by making it much less flexible. Referring to figure 6, if the formulae in column H were hard-coded e.g. =G8/9 (in cell H8) instead of =G8/D8, and if any of the values in column D (number of staff) changed, the formula in column H of the same row would have to be re-written. This is just a simple example to illustrate the concept of hard-coding being a source of error.

It should also be noted that some numbers, which at first sight appear to be constants, are often in fact variables. For example, the rate of inflation or the percentage value for employees' pension contributions ⁸.

6. CONCLUSION

The classification of spreadsheet errors has been found to be very useful in analysing specific types of spreadsheet errors. It also enables users to gain a better understanding of the different types of errors that can occur in their spreadsheet models. Appropriate tools, techniques and methods can subsequently be developed to prevent their occurrence in the first place or enhance the chances of detecting these errors after they have occurred. In addition to that, when a new specific type of error is identified, it can be placed in the appropriate category within the taxonomy. In the process of classifying the error, spreadsheet developers and end-users are bound to gain a much deeper understanding of the error. This is because they will be forced to examine and compare its characteristics with those of other spreadsheet errors.

A	B	C	D	E	F	
	Tea(£)	Milk(£)	Coffee(£)		Exchange Rate (£ to RM)	1
1st Quarter	450	560	467		7.3	2
2nd Quarter	904	900	352			3
3rd Quarter	872	800	233			4
4th Quarter	123	234	901			5
						6
Total Sale of Tea & Coffee (RM)						7
=SUM(B2:B5, D2:D5)*F2						8

Figure 5

Staff Budget Costs 1995-1996

C	D	E	F	G	H	
	Number of Staff	Emp. Wages	High Wages	Total Program	Average Wages	5
Grade 1	1	17700.50	0.00	=SUM(E6:F6)	=G6/D6	6
Grade 2	3	45540.00	1400.55	=SUM(E7:F7)	=G7/D7	7
Grade 3	9	122340.00	2000.00	=SUM(E8:F8)	=G8/D8	8
Grade 4	12	102350.25	0.00	=SUM(E9:F9)	=G9/D9	9
Grand Total	=SUM(D6:D9)	=SUM(E6:E9)	=SUM(F6:F9)	=SUM(G6:G9)	=G10/D10	10

Figure 6

REFERENCE LIST

- [1] KPMG (1997). *Executive Summary: Financial Model Review Survey*, KPMG Management Consulting (London).
- [2] Ward M (1997, August 16). *Fatal Addition*, New Scientist.
- [3] Encyclopaedia Britannica Online
- [4] Rajalingham K, Chadwick D, Knight B and Edwards D (1999). *An Integrated Spreadsheet Engineering Methodology (ISEM)*, Proceedings of the Third Annual IFIP TC-11 Working Group 11.5 Working Conference on Integrity and Internal Control in Information Systems, Amsterdam, The Netherlands, 18-19 November 1999, Kluwer Academic Publishers.
- [5] Rajalingham K and Chadwick D (1998). *Integrity Control of Spreadsheets: Organisation & Tools*, Proceedings of the Second Annual IFIP TC-11 Working Group 11.5 Working Conference on Integrity and Internal Control in Information Systems, Virginia, USA, November 19-20, 1998, pp147-168, Kluwer Academic Publishers.
- [6] Panko R R and Halverson R P, Jr. (1996). *Spreadsheets on Trial: A Survey of Research on Spreadsheet Risks*, Proceedings of the Twenty-Ninth Hawaii International Conference on System Sciences, Maui, Hawaii, January 2-5, 1996.
- [7] KPMG (1998). *Review of Client Spreadsheet Models*, KPMG Management Consulting (London).
- [8] Batson J and Brown A (1991, Autumn). *Spreadsheet Modelling Best Practice*, Accountants Digest, 2730.
- [9] Stang, D. (1987), *Spreadsheet Disasters I have known*, Information Center, 3:11, November, pp. 26-30.
- [10] Chadwick D, Knight J and Clipsham P (1997). *Information Integrity In End-user Systems*, Proceedings of the IFIP TC-11 Working Group 11.5 First Working Conference on Integrity and Internal Control in Information Systems, Zurich, Switzerland, December 1997.

Kamalesen Rajalingham is in the final year of his PhD at the University of Greenwich. His area of research has been Spreadsheet Errors and the Associated Business Risks.

Sorting Out that Subversive Spreadsheet (and Having a Good Time Whilst Doing So!)

David Chadwick

On the 17th and 18th July, at the University of Greenwich, a symposium was held entitled 'Spreadsheet Risks, Audit and Development methods'.

It was organised by members of EuSpRIG (European Spreadsheet Risks Interest Group). The symposium was attended by auditors, accountants, consultants from the Big 5 management consultancies, bankers and public sector managers as well as researchers from several universities. The event was sponsored by ISACA(UK Northern Chapter) and supported by the University of Wales, the ICAEW and, of course, CASG. CASG members attending were given a 10% discount on the fee.

Delegates were welcomed to the university by Professor Brian Knight who gave a short history of the university campus, formerly the Royal Naval College, at which the event was being held. This was followed by a brief speech entitled 'Stop The Subversive Spreadsheet' in which Ray Butler, HM Customs & Excise and EuSpRIG Chairman, and David Chadwick, Symposium Organiser, described the factors that drove four people to meet for the first time in March 1999 to found the group and begin preparations for a symposium. Ray concluded by welcoming somebody who had worked for more than fifteen years to raise awareness of spreadsheet risks throughout the world - Ray Panko of the University of Hawaii.

Ray Panko chaired the first session 'Extent of the Problem: types of errors and risks' and, himself, gave a paper which immediately drew attention to the magnitude of the problem. He cited four major pieces of research since 1997 which used field audits of real business spreadsheets and which together gave an average error rate of 91% - an astoundingly high figure! He then discussed possible causes of such error-rates, common methods of error-prevention, detection and audit and their obvious and not-so-obvious shortcomings. Ray then introduced Pat Cleary, University of Wales.

Pat discussed his forthcoming research programme which would evaluate the importance of spreadsheets to organisations. Pat proposed to investigate several organisations spanning the areas of health, retailing and public utilities. Many delegates expressed their support for this work and especially Ray Panko himself who stated that knowledge of the true reliance of organisations on their spreadsheets would give greater credence to public acceptance of the alarming data on error-rates.

The first session was concluded with a paper presented by Kamal Rajalingham, a PhD student, who showed his comprehensive taxonomy of spreadsheet errors which he considered could classify any practical error found in the wild. The audience rose to this obvious challenge and presented Kamal with obscure practical error instances of their own daring him to classify them using his taxonomy. In each case he was successful.

Session two began with the chairperson Barry Pettifor, director of Spreadsheet Assurance Services at Pricewaterhouse Coopers, discussing the need for business and academia to explore better 'Development Methodologies and Techniques'. Barry then introduced Brian Knight again, this time in the role of presenter, to talk about a structured methodology for modelling spreadsheets developed by researchers at the Greenwich. 'Spreadsheets are a form of software which model complex systems' said Brian and went on to explain the importance of any methodology being based on sound

software engineering techniques. Brian then showed a modelling method based on techniques proven, over time, to improve the quality of more mainstream software.

Next came Yirsaw Ayalew, of the University of Klagenfurt in Austria. Yirsaw discussed his own methods of building and testing spreadsheet models beginning with the same software engineering approach as Brian but pointing out that although 'spreadsheets are software' there was the inherent problem that 'spreadsheet authors were not programmers'.

The first day ended with many delegates coming together for a guided tour of the sights of Greenwich arriving eventually in a very pleasant restaurant where the conversation and glasses of wine continued into the late evening. And, as the saying goes, 'a good time was had by all'.

The second day began with Leon Strous, of De Nederlandsche Bank in Amsterdam, chairing the third session 'Audit Methodologies and Techniques'. Ray Butler returned to the platform to deliver his own paper on risk assessment for spreadsheet developments. Ray's experience of errors in VAT models stretches back almost fifteen years and much of that was evident in his talk on the factors that made a spreadsheet prone to error. 'Risk assessment is at the heart of all auditing' he began, pointing out that the risks of error arising from poor practice are known to be high, and the incidence of good practice in development is known to be low. 'Despite this' he continued 'users are blissfully unaware of these risks and are using potentially faulty decision support machinery every day to take vital business decisions'. Ray explained some of the methods that HM Customs and Excise used in checking VAT spreadsheets. Following Ray, was Hoch Chuan Chan, of the University of Singapore.

Hoch's paper concentrated on how the difference between surface structure and deep structure in spreadsheet models was a major cause of difficulty when it came to checking. He described several visual checking methods that he had tried and which appeared successful. Lastly, Andrew Hawker of the University of Birmingham, presented a short but interesting paper looking at the inherent problems associated with the use of the built-in accounting functions. Andrew drew attention to the difference in use of accounting functions in the UK and the USA and the confusion this could cause with products like Excel which were oriented to the American market. He also mentioned how novice spreadsheet users could be deluded by 'wizards' into thinking they had used a function correctly when in fact they had not. Interestingly, Andrew's paper was based on an article he had once published in the CASG Journal and which had caused some interest at the time.

The last session was chaired by Ray Butler and devoted entirely to practical demonstrations of software tools particularly audit tools. James Sarmecanic of Operis demonstrated OAK (Operis Analysis Kit) and Alastair Stewart, of IIM Customs and Excise, presented the main functions of their SpACE tool (SPreadsheet Audit for Customs & Excise). Anthony Berglas, designer of 'Spreadsheet Detective' had been unable to attend the symposium and his product was given a short demonstration by Dilwyn Edwards of the University of Greenwich.



The symposium rounded itself off with a panel of the four chairpersons opening discussion on how EuSpRIG should act to improve general awareness of spreadsheet risks, to develop research initiatives and to aid in setting standards of best-practice. This produced lively discussion and a healthy atmosphere of differing opinions. In addition, several delegates expressed their surprise that a meeting on such a neglected area of business risk had produced such good attendance from all quarters and such interesting contributions from all presenters. As if to herald the future prospects of EuSpRIG, Leon Strous, of De Nederlandsche Bank, lent his support to organising a symposium next year in Amsterdam.

The proceedings ended with a delicious buffet and, for many, a guided tour of the main tourist attractions of the university site: the Painted Hall, the Chapel and the exhibition of Crown jewels.

If you would like to know more about EuSpRIG you may wish to view the web-site on <http://www.gre.ac.uk/~cd02/eusprig/> or contact David Chadwick on D.R.Chadwick@gre.ac.uk.

Copies of the symposium proceedings giving all papers in full are available at £20.

CASG Annual Meeting

Andrew Hawker

The AGM in May attracted a good number of members on what turned out to be one of the hottest days of the year. Especial thanks are due to KPMG not just for the use of a room in their Blackfriars offices, but for laying on a generous supply of cold drinks.

John Bevan steered the meeting expertly through the AGM agenda, and introduced Derek Oliver, a consultant and one-time government auditor, who had accepted the challenge of presenting a review of recent developments surrounding BS7799.

This Derek proceeded to do in an entertaining and informative style. He described how BS7799 has changed since its inception in 1995. In its early days, it reflected its origins in one particular company (Shell), and was quite detailed and prescriptive. Since then, it has evolved into a much broader standard which aims to be more adaptable and user-friendly. At the same time, he was quite open about some of the practical difficulties which face those who are trying to promote and apply BS7799, and the various factors which

inhibit its uptake on a wider scale. For example, it is still quite daunting and expensive to qualify as BS7799 auditor. He also drew attention to some of the conflicting demands made on the standard. On the one hand, it is intended to apply to all systems, not just those based on computers. On the other hand, it still has to remain relevant for companies which are moving on to brand new technologies, such as those based on the Internet.

Derek commended the principles of BS7799 as a basis for internal review and benchmarking, even if companies did not intend to go for full accreditation. He stressed how important it was for those with auditing skills and experience to be involved in all such exercises. By the end of the evening, most people had probably lost a little weight, but gained a much better insight into how this fledgling standard is progressing.

The Web Page

Professional Bodies Concerned with Computer Audit

Andrew Hawker

When professional organisations first set up web sites, no-one seemed to be quite sure what to put on them. They did not want to be seen in the same light as dot.coms selling cheap flights or CD's, but they still wanted to establish a presence on the Net - preferably in ways which enhanced their social standing. This resulted in various mixtures of reports, surveys and brochure material, some no doubt hastily adapted from publications previously available in printed form. The result was that it was often easy for the casual browser to chance upon interesting nuggets of information.

Since then the site providers have become a lot more canny. Professional bodies are now much less hesitant about promoting themselves, and devote an increasing amount of space to marketing services specifically to their members. Good news for the members, no doubt, but it makes it harder for everyone else to find useful information. The nuggets are still there, but require a lot more digging.

Professional sites of potential interest to computer auditors can be divided into two main categories:

1. the accounting profession. The bodies that offer chartered status in the UK set the agenda for the accounting profession, particularly through the curricula which they specify for their examinations. They are all keen to promote better understanding of computer-based techniques in audit, and want entrants to the profession to have a good grasp of IT basics. Exam requirements are usually set out on the web sites in some detail, and if a topic is set in the syllabus there will often be supporting guidance to help with study.

Since these bodies are mainly concerned with external audit, internal audit does not feature to any great extent. This bias, it seems, is picked up by candidates for the qualifying exams. CIMA (www.cima.org.uk) provides some feedback on its 1999 exams, and in respect of one paper it complains of "...candidates with extremely limited knowledge of internal audit, who failed to demonstrate that any significant study had been made of this 25% section of the syllabus. Some candidates demonstrated that they had studied this part of the syllabus, but without gaining any understanding of internal audit. Their answers were largely demonstrations of rote learning, which were often substantially irrelevant to the specific questions".

ACCA offers online ordering of conventional reports, including some on computer-related topics, particularly where these are related to its examinations (www.acca.org.uk). The Scottish Institute, ICAS, has some similar options (www.icas.org.uk). Public sector accounting is perhaps better served, with archived articles from the weekly *Public Finance* magazine, on CIPFA's site at www.cipfa.org.uk. CIPFA also offers its *Computer Audit Guidelines* for sale, at an eye-watering price of £97.50.

The ICAEW has perhaps the most ambitious site (www.icaew.co.uk - note that this is one site that does not use the "org" suffix. Visitors to the "org" equivalent will find a jumble of references maintained by the Computer Science department at

Birmingham University). Using the ICAEW site can be frustrating, as navigation is sometimes complicated by the differences between options for members and non-members. Generally accessible pages include a useful list of URL's maintained by the Institute's Library, and press releases about representations made by the Institute on matters such as pending legislation and government consultations.



2. internal and computer audit. These sites are predominantly American, although some have UK off-shoots, such as the lively site operated by the ISACA London Chapter at www.isaca-london.org. The UK-based Institute of Internal Auditors can be found at www.iiia.org.uk. This has informal links with both its US counterpart, and CIPFA. It has updated its site to give it a highly modernistic feel, including a 20-second introduction using Shockwave, during which the moon rises over a pyramid (explanations and interpretations to the editor, please). The IIA "Knowledge Centre" offers a good collection of short articles from its magazine. Its "Networking" pages turn out to refer to networking of the old-fashioned kind, with details of special interest groups, and other contacts.

The IIA in the USA offers comparatively little on its public pages at www.theiia.org, though clearly there are plenty of materials for members. More publicly accessible information is to be found at the home site of ISACA (the International Systems Audit and Control Association), at www.isaca.org. This offers an archive of short articles on topics relevant to computer audit, and details of standards with which ISACA is involved (particularly COBIT). The other US contender is the International Information Systems Security Certification Consortium, at www.isc2.org. This has a very "busy" home page, with a pointer to a site map which is not a great deal clearer. The emphasis is mainly on facilities for members, and advice and guidance for those studying for the CISSP examination. There is quite a comprehensive set of useful URL's under the heading of "Security Links".

And the CASG? Currently we have a competent but not very exciting set of pages under the umbrella of the BCS at www.bcs.org.uk, as does the Information Security Specialist Group. The CASG chairman has indicated that he would dearly like to expand and improve this. Unfortunately, public expectations of web pages are getting higher all the time. No doubt this will be an item on the agenda in the ongoing merger discussions with ISSG.

If you know of any useful sites that have been overlooked, or have any other observations on the use of Web sources in computer audit, your comments will be welcomed. Andrew can be contacted at: Department of Accounting & Finance, University of Birmingham, Birmingham B15 2TT. 0121 414 6675. A.Hawker@bham.ac.uk

BCS MATTERS!



Colin Thompson
BCS Deputy Chief Executive

Colin Thompson, BCS Deputy Chief Executive, reviews some of the current BCS news items. Further information on these or any other BCS related issues may be found on the BCS Web site ("<http://www.bcs.org.uk/>")

Information is also available from Customer Services at The British Computer Society, 1 Sanford St, Swindon SN1 1HJ (e-mail to marketing@hq.bcs.org.uk)

Looking Back on a Successful Year.

The BCS financial year closes on 30th April each year and the results are presented to the Annual General Meeting each October. This year's report will show that 1999/2000 was a particularly successful year for the Society. The 'stars' of the show last year were the European Computer Driving Licence, and the ISEB qualifications, but other areas performed well, including the Professional Exams. Overall, the accounts show an increase in income of just over £1m over the previous year and a surplus of over £400K.

This success is part of a pattern extending over some years and it shows very clearly that the BCS is maintaining its position of relevance to both the IT community, both users and practitioners. It also means of course that we can continue to invest in improvements for the future, in terms of both new services for the future and enhancements to the infrastructure.

The BCS Web Initiative

The Web is at the top of the list of priorities for investment in infrastructure enhancement. The Society has had a web site for some years and it is now a very comprehensive database of BCS related information - thanks very largely to the efforts of Carl Harris the Web Editor. However, we now need to take that on from being simply a repository of information, to being the main medium for both transactions and relationships between the BCS and its members and customers.

That will involve a very substantial investment together with a change in business processes and culture - and all that at a time when we have a range of other changes in progress. The Society is however committed to making both the investment and the change and the work is being overseen by a steering group of the Policy and Resources Committee led by David Morriss, Vice president External relations.

Programme 2000Plus

Programme 2000Plus was the main subject of my column in the previous two editions of this newsletter. The points-based admission system, introduced in May, is now beginning to show a return, in the form of a very significant increase in the number of applicants coming forward for membership. The next stage of the work is also moving forward and we have had an excellent response to the market survey being conducted by Metra Martech.

The whole question of the future member structure of the Society will be the subject of this year's weekend meeting of the Policy and Resources Committee and it is likely that we shall be putting proposals to the membership in the early part of next year. In the meantime, further information about the programme - and a copy of the survey questionnaire - are available at <http://www.bcs.org.uk/2000plus/news/index.htm>

New On-line services for Members

'What do I get for my money?' is one of the frequently asked questions at membership presentations. That is my cue to roll off a list of services and benefits, running from professional qualifications through to publications. We are of course always looking for ways of adding to that list and the past year has seen the addition of a number of new on-line services.

The first of these was access to the ACM Digital Library, where BCS members now have access at the same discounted rates as ACM members - approximately £12 per year for students and £55 for others. The library, which is available on-line 24 hours a day - holds the full text of more than 20 ACM journals and magazines and conference proceedings extending back over 9 years. An enormous resource, of real value to many BCS members.

July saw the addition of CSS Online (the Computer Software & Services Online directory) to the portfolio. This resource is

provided by Learned Information, part of the VNU group, the publishers of titles such as Computer Users Year Book and Software Users Year Book. CSSOnline, provides a fully searchable database of over 14,000 software products and contact information for over 8,000 IT suppliers and services providers in the UK. The service, which is free to BCS members, is available at www.cssonline.co.uk

September will see the launch of a new membership services portal, under the label Members Extra. This portal will be available from the main BCS site and will provide access to a range of information and on-line shopping facilities. This will include all the services provided by membership Services Direct, the approved supplier of financial, insurance and other services to BCS members. It will also include a wide range of discount and other on-line shopping facilities. One of the aims for the new facility is to provide members with a level of assurance that the companies with which they are dealing are reputable. All on-line retailers will be encouraged to join the Which on-line trading scheme and there will be feedback arrangements to allow members to record service quality - both good and bad. Should any retailer provide unsatisfactory service, they will of course be removed.

The final item in this list of new services relates to discounts on PC hardware. The value of such discounts, both to home users and for business, are obvious but the fact that both specifications and prices change so rapidly has made it impossible to maintain a discount arrangement in the past. However, we have now reached agreement with Evesham.Com for a BCS member discount across the full range of their PCs and servers.

Evesham.Com - formally Evesham Micros - have been the main supplier of hardware for BCS HQ since 1997 and we have been impressed both with the equipment and the company. We have found their PCs well made and reliable and

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their standard 2 year on-site warranty is better than most other PC manufacturers provide.

These discounts will be accessible via a button on the Members Extra portal which will lead to an on-line ordering service that has an automatic 5% discount from the prices advertised to the general public.

Overall, these on-line services represent a significant value addition to BCS membership. Equally important, from my point of view, they make it just a bit easier to answer the 'what's in it for me?' questions.

And Finally.....

Time to book your seat for the BCS Annual Dinner, to be held, as last year, at the Brewery in London. This year's guest speaker will be Professor Susan Greenfield Honorary FRCP, CBE. Susan became the first female Director of The Royal Institution of Great Britain in 1998. She also received the Michael Faraday Medal, from The Royal Society, for making the most significant contribution in 1998 to the public understanding of science. Susan heads a team studying Parkinson's and Alzheimer's disease, in addition to which she has written extensively on the physical basis of the human mind. Published on 1

June, her latest book is entitled 'The Private Life of the Brain'. Susan has made a wide range of broadcasts on TV and Radio - included in which was the prestigious Richard Dimbleby lecture on BBC1 in November 1999.

Further information on the dinner can be found at:
<http://www.bcs.org.uk/news/dinner.htm>
or from Suzanne Peart at BCS HQ
(01793 417434)

Caption Competition

The winner of last issue's cartoon competition is Alan Foreman who suggested the following caption.

A gift voucher is on its way Alan.



"... and this new breed of servers can deliver at speeds in excess of 130 mph. That one's gone right through the net ... to who nose where!"

HUMOUR PAGE

WORD GAMES

The Washington Post recently published a contest for readers in which they were asked to supply alternate meanings for various words. The following were some of the winning entries:

Abdicate (v.), to give up all hope of ever having a flat stomach.

Esplanade (v.), to attempt an explanation while drunk.

Willy-nilly (adj.), impotent

Flabbergasted (adj.), appalled over how much weight you have gained.

Negligent (adj.), describes a condition in which you absentmindedly answer the door in your nightie.

Lymph (v.), to walk with a lisp.

Coffee (n.), a person who is coughed upon.

Flatulence (n.) the emergency vehicle that picks you up after you are run over by a steamroller.

Balderdash (n.), a rapidly receding hairline.

Testicle (n.), a humorous question in an exam.

Semantics (n.), pranks conducted by young men studying for the priesthood, including such things as gluing the pages of the priest's prayer book together just before vespers.

Rectitude (n.), the formal, dignified demeanor assumed by a proctologist immediately before he examines you.

Circumvent (n.), the opening in the front of boxer shorts.

Frisbatarianism (n.), The belief that, when you die, your soul goes up on the roof and gets stuck there.

The Washington Post's Style Invitational also asked readers to take any word from the dictionary, alter it by adding, subtracting or changing one letter, and supply a new definition.

Here are some recent winners:

Sarchasm: The gulf between the author of sarcastic wit and the reader who doesn't get it.

Reintarnation: Coming back to life as a hillbilly.

Giraffiti: Vandalism spray-painted very high.

Foreplay: Any misrepresentation about yourself for the purpose of obtaining sex.

Inoculate: To take coffee intravenously.

Osteopornosis: A degenerate disease.

Karmageddon: It's like, when everybody is sending off all these really bad vibes, right? And then, like, the Earth explodes and it's like a serious bummer.

Glibido: All talk and no action.

Doppler effect: The tendency of stupid ideas to seem smarter when they come at you rapidly.

Intaxication: Euphoria at getting a refund from the tax office, which lasts until you realize it was your money to start with.

And, best of all...

Ignoranus: A person who's both stupid and an a@#hole.

PERSUASIVE ARGUMENTS

(We all know just how important it is to clearly and constructively present our arguments in the final report. Here is an example par excellence - Ed)

The following is an actual extra credit question given on a University of Washington chemistry mid term. The answer was so profound that the professor shared it with colleagues, which is why we now have the pleasure of enjoying it as well:

Bonus Question: Is Hell exothermic (gives off heat) or endothermic (absorbs heat)?

Note: Most of the students wrote proofs of their beliefs using Boyle's Law, (gas cools off when it expands and heats up when it is compressed) or some variant. One student, however, wrote the following:

First, we need to know how the mass of Hell is changing in time. So we need to know the rate that souls are moving into Hell and the rate they are leaving. I think that we can safely assume that once a soul gets to Hell, it will not leave. Therefore, no souls are leaving. As for how many souls are entering Hell, lets look at the different religions that exist in the world today.

Some of these religions state that if you are not a member of their religion, you will go to Hell. Since there are more than one of these religions and since people do not belong to more than one religion, we can project that all souls go to Hell. With birth and death rates as they are, we can expect the number of souls in Hell to increase exponentially.

Now, we look at the rate of change of the volume in Hell because Boyle's Law states that in order for the temperature and pressure in Hell to stay the same, the volume of Hell has to expand as souls are added. This gives two possibilities: 1. If Hell is expanding at a slower rate than the rate at which souls enter Hell, then the temperature and pressure in Hell will increase until all Hell breaks loose. 2. Of course, if Hell is expanding at a rate faster than the increase of souls in Hell, then the temperature and pressure will drop until Hell freezes over.

So which is it? If we accept the postulate given to me by Ms. Teresa Banyan during my Freshman year - that it will be a cold day in Hell before I sleep with you, - and take into account the fact that I still have not succeeded in having sexual relations with her, then, it cannot be true, and thus I am sure that Hell is exothermic and will not freeze.

The student received the only "A" given.



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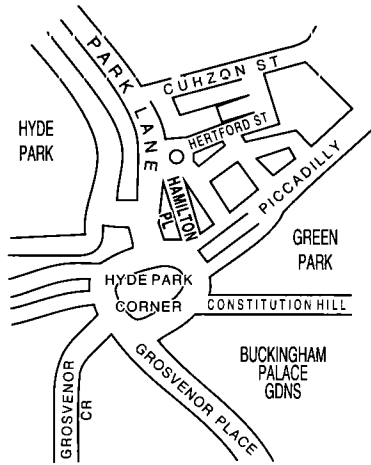
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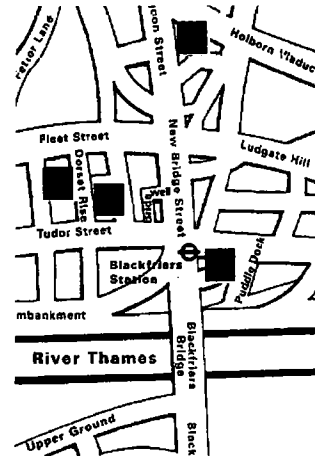
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