The purpose of this paper is to explain the concept and describe the methodology by which data may be summarized and various typical Management Information Systems (MIS) issues expressed in terms of overall business profitability. This is accomplished via the organization of data into a Profit & Loss (P&L) statement in the format commonly viewed by senior management.

This approach was developed over time as MIS manager for large credit card operations, with millions of cardholders. For purposes of example, that application is presented here, although the approach is analogous to all types of business. The following represents a simplified P&L for a credit card operation:

**INCOME**
- Finance Charges: $9700
- Interchange Income: 1928
- Fee Income: 2459
- **TOTAL INCOME**: 24087

**EXPENSES**
- Interest Expense: 7431
- Bad Debt Expense: 4926
- Marketing Expense: 3710
- Overhead Expense: 2473
- **TOTAL EXPENSE**: 18541

**PRE-TAX INCOME**: 5546

Traditionally, the branches of the business concerned with strategic decision-making are Marketing (primarily concerned with business acquisition and maintenance), Credit (primarily concerned with managing the risk of bad debt), and Finance (where accounting streams are merged and the P&L is assembled).

Traditional MIS is concerned with indirectly estimating variables which impact profitability. Since the credit card P&L element deemed most "controllable" is bad debt expense, the Credit branch controls the generation of most MIS, where the emphasis is on delinquency trends for use in Collections efforts.

Credit card usage, average balance, and average purchases are other commonly tracked variables, relating to finance charge income and other income items on the P&L.

The following are common issues in the credit card industry: Should interest rates charged to cardholders be raised, lowered, or tiered? Is payment delinquency (a gauge of expected bad debt) within acceptable limits? Should the annual fee be waived, or the line of credit increased?

For purposes of example, the first issue is assumed to be relevant. The following scenario is assumed: deepening recession is feared, and the cost of funds (interest expense) is projected to rise. Several major credit card banks have recently raised the interest rate to their cardholders. Shall our bank do the same?

In order to make this decision, senior management requests the MIS provider to generate key statistics by current interest rate — average balance, average finance charge, average purchases, average bad debt, etc. The MIS database consists of one record per cardholder (an extract from a point-in-time dump of the Customer Master File). To provide the requested data, the MIS Manager sums the fields FINCHG, PURS, FEES, BADDEBT, and BALS with the procedures PROC SUMMARY (or PROC TABULATE). The PROC SUMMARY, and a simple PROC PRINT of the output data set would look something like the following:

**Program code:**

```sas
proc summary data=master; 
class INTRATE; 
var FINCHG PURS FEES BADDEBT BALS; 
output out=OUT sum=; 
run;
```

**Printed output:**

```
INTRATE   TYPE   PURS   FEES   BADDEBT   BALS
     .1   9700  1928  2459  18541  5546
     .16  7431  4926  3710  18541  5546
     .11  9040  3282  1081  2473  4926
     .18  5909  3737  18615  18541  5546
```

The PROC SUMMARY has reduced the large database to four records: one record with the sum of each
requested variable, and one record for each interest rate. Traditionally, this data would be further reduced to average figures per cardholder, e.g. average purchase in this case would equal PURS / _FREQ_.

The MIS provider, with an understanding of the P&L elements relevant to the business, can directly express information in terms of overall profitability, i.e., the P&L. In this example (returning to the initial P&L), the goal would be to express the information in the following format:

```
TOTAL .169 .179 .189
$(000) $(000) $(000) $(000)
```

<table>
<thead>
<tr>
<th>INCOME</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance Charges 19700</td>
<td>?</td>
</tr>
<tr>
<td>Interchange Income 1928</td>
<td>?</td>
</tr>
<tr>
<td>Fee Income 2458</td>
<td>?</td>
</tr>
<tr>
<td>TOTAL INCOME 19406</td>
<td>?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Expense 10652</td>
<td>?</td>
</tr>
<tr>
<td>Bad Debt Expense 4926</td>
<td>?</td>
</tr>
<tr>
<td>Marketing Expense 1377</td>
<td>?</td>
</tr>
<tr>
<td>Overhead Expense 4464</td>
<td>?</td>
</tr>
<tr>
<td>TOTAL EXPENSES 21419</td>
<td>?</td>
</tr>
</tbody>
</table>

```
FINCHG = round(finchg,1);
intexp = round(intexp,1);
baddebt = round(baddebt,1);
mktg = round(mktg,1);
overhd = round(overhd,1);
totexp = round(totexp,1);
```

Some of the required values are directly available from the PROC SUMMARY, i.e. Finance Charges (FINCHG), Fee Income (FEES), and Bad Debt Expense (BADDEBT). The remaining items are estimable by algorithms, as follows:

**Output from the PROC SUMMARY**

- **Interest Inc** = .013 X PURS
- **Interest Exp** = Prevailing Rate (e.g. .10 X BALs)
- **Marketing Exp** = avg $ per c/h (e.g. $60)
- **Overhead Exp** = avg $ per c/h (e.g. $40)

The output set from the PROC SUMMARY may be followed by a data set procedure to estimate values for the remaining variables necessary for the P&L:

**Program code:**

```
data OUT2; set OUT;
  interch = PURS * .013;
mktg = _FREQ_ * 60 / 12;
overhd = _FREQ_ * 40 / 12;
totinc = FINCHG + interch + FEES;
totexp = intexp + BADDEBT + mktg + overhd;
ptxinc = totinc - totexp;
run;
```

At this point, all the required variables and values are present for the MIS P&L. The next (and critically important) task is to reformat the information in the style produced by Finance. This is necessary in order to ensure that the information will be taken seriously and studied attentively by senior management.

A PROC TRANSPOSE and some labeling options must be utilized in order to achieve the final P&L product. The following code is presented as a prototype:

**Program code:**

```
data dol; set out2;
type = _n_; ddum1 = .; finchg = round(finchg,1); fees = round(fees,1); totinc = round(totinc,1); ddum2 = .; intexp = round(intexp,1); baddebt = round(baddebt,1); mktg = round(mktg,1); overhd = round(overhd,1); totexp = round(totexp,1); ddum3 = .; ptxinc = round(ptxinc,1); run;
```

```
proc transpose data=dol out=dol prefix=doli;
```

```
proc format;
value vfmt .=' I 1= 'TOTAL' 2=1.169 1 3=1.179' 4=1.189; proc format;
value $nfmt 'TYPE'=' 'DDUM1'=' 'FINCHG='='Interest Inc' 'INTERCH'='Interchange Inc' 'FEES'='Fee Inc' 'TOTINC'='TOTAL INCOME' 'DDUM2'=' 'INTEXP'='Interest Exp' 'BADDEBT'='Bad Debt Exp' 'MKTG'='Marketing Exp' 'OVERHD'='Overhead Exp' 'TOTEXP'='TOTAL EXPENSES' 'DDUM3'=' 'PTXINC'='PRE-TAX INCOME';
```

```
proc print data=dol noobs label;
var name dol12 dol13 dol14;
format dol1 dol2 dol3 dol4 $vfmt. name $nfmt.;
label name = 'P&L MIS'; dol1='$(000)' dol2='$(000)' dol3='$(000)' dol4='$(000)';
run;
```
In summary, this procedure marks the wedding of MIS and Finance, requiring that the MIS provider gain a working knowledge of financial concepts and the company P&L. Since the P&L represents the "bottom line" of profitability, the significant advantage over traditional MIS reporting lies in the ability to disaggregate the P&L by issue. This can lead to a significant improvement in decision making within the firm, and mark the birth of a new generation of MIS reporting.