Paper 045-2013

Using SAS® Enterprise BI for Integrated Bank Reporting

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ABSTRACT

This paper shows how base SAS,SAS Enterprise Guide, ETS and SAS Enterprise BI are used to provide a comprehensive view of bank performance. Data is extracted from the G/L, loan, deposit and application systems, real time data is accessed to provide up-to the minute results on loan activity and system reports are read in to provide additional information. Proc Computab is used to create financial statements, OLAP cubes are used to provide reports on bank balance sheet components and budget comparisons on non-interest income and expense items by department, and dashboards are used to provide real time reports on loan originations. The reports are presented using SAS BI through the SAS data portal to provide real time, trend and historical reports on the bank's performance.

INTRODUCTION

Daily reporting provides management with up to date information giving them the ability to anticipate issues and proactively address them as they are developing rather than reacting to them. At Farm Bureau Bank a number of reports are produced and updated daily to provide a full picture of the current operating conditions of the bank. This paper discusses creation of the reports and the presentation of reports using SAS Enterprise BI. The development and presentation of the following reports is presented:

- Financial balance sheet and income statement
- Variance reports with actual, budgeted and difference are presented by department and line item, with the ability to drill down to the individual general ledger entry.
- Daily and monthly new account volume
- New account volume by geographic area and type.

The reports are presented using the SAS Information Portal,

DATA EXTRACTION AND REPORT CREATION OVERVIEW

The bulk of the data used to create the daily financial reports; budget vs. actual comparisons and tracking the bank's loan volume is extracted using batch processing. The batch jobs are run overnight via Windows scheduler in base SAS. Running these programs overnight saves processing resources during peak business hours. Overnight processing also allows for reports to be ready for review at the start of business each day

In addition to the nightly processing performed in base SAS, Farm Bureau Bank analysts use Enterprise Guide as an ETL platform to update several data warehouses. The bank receives daily data feeds from credit card vendors as well as daily loan application and account files. This information is extracted, cleaned and added to application and account fact tables.

The final data extraction process is done through stored processes. The data gathered using batch processing and Enterprise Guide projects are used to give an overview of the previous day's business. The stored processes are designed to pull data from the banking system live. This allows management to follow the current day's loan business in real time. Live data processing is also used to determine near future work load. Knowing that a certain dollar amount of loans are soon to be advanced allows for the lending department to adjust its staffing needs accordingly.

Once the data is extracted, the various tables and cubes are updated. Then, using the information portal management has access to the reports needed to analyze bank performance.

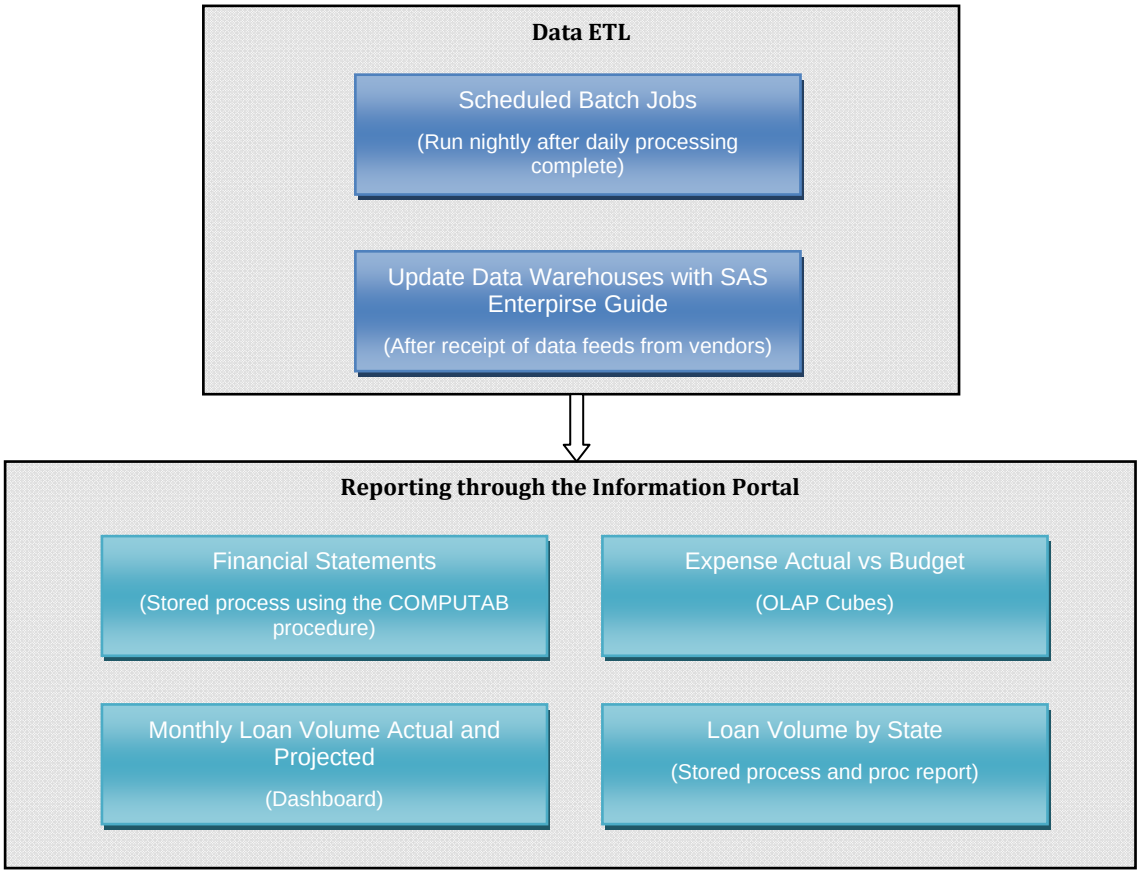

Figure 1. ETL and Reporting Process

MONTHLY FINANCIAL REPORTING USING COMPUTAB

DATA TRANSFORMATION AND PREPARATION

The actual data for the financials is obtained through the data extraction. Because this is run every night, the actual data is current as of the previous days financial processing. Budgeted data is determined using a separate system and an excel file is created with the budgeted data. The budgeted data has the same line items as the actual financials so that it can be used in the same manner as the actuals. The budget is loaded from the excel sheet once when the budget is finalized and put into a permanent SAS table.

After the current actual data has been extracted, it is necessary to assign financial categories to the individual ledger accounts. This enables the accounts to be summarized in the financial categories that are presented in the financial statements. Both the budgeted and actual data are assigned IDs and descriptions based upon financial reporting categories.

For the COMPUTAB procedure, each budgeted and actual account is assigned an id which will be used in the creation of the computab report and a description. The description corresponds to the description in the financial statement where that line item is summarized. Figure 2 shows a sample of the table used to assign the ids and description to the line items.

ledger	id	Description1
518450	idet12600	Loan Expense
518605	idet12600	Loan Expense
520105	idet12650	Premium Amortization
520305	idet12650	Premium Amortization
514815	idet12700	VISA Expense
513665	idet12750	New Account Costs
513670	idet12750	New Account Costs
518005	idet12800	Fraud
518010	idet12800	Fraud
518015	idet12800	Fraud
518020	idet12800	Fraud
518030	idet12800	Fraud
518035	idet12800	Fraud
518040	idet12800	Fraud
519020	idet12800	Fraud
516605	idet12850	Miscellaneous
519005	idet12850	Miscellaneous
519006	idet12850	Miscellaneous
519010	idet12850	Miscellaneous
519015	idet12850	Miscellaneous
515615	idet12900	Other Taxes ul
100005	bsdet0100	Due From Banks
100010	bsdet0100	Due From Banks
100505	bsdet0100	Due From Banks
100520	bsdet0100	Due From Banks
105005	bsdet0100	Due From Banks
105010	bsdet0100	Due From Banks
105025	bsdet0100	Due From Banks
105035	bsdet0100	Due From Banks

Figure 2. Ledger Number Categories for Use in Computab

For the final reporting using PROC COMPUTAB, the budget and actual amounts are put into a table with the column heading indicating the type of data, whether actual or budgeted and the month and year of the data. The SUMMARY procedure is used to create totals for each line item and these are then put into a data table. Figure 3 is a sample of the data table that is used as input to the PROC COMPUTAB reporting process. The ids that have been previously assigned are in the first column. The other columns contain either the actual or budgeted ending balance sheet amounts, signified by the prefix **BSE.** Additional columns contain data for actual and budgeted average monthly data and actual and budgeted income data.

With the data in this table, actual and budgeted reports can be produced for both the income and the balance sheet. The user is given the option of choosing the type of report (income statement or balance sheet) and the month(s) that they would like the report to cover.

id	BSE2013Act01	BSE2013Act02	BSE2013Act03	..	BSE2013Bud01	BSE2013Bud02	BSE2013Bud03	..
bsdet0100	1046956.83	2056292.69	3068075.5		1200441	1200441	1200441	
bsdet0200	19080722.24	28616169.14	30707662.12		29554448	29873218	26097532	
bsdet0300	127000	125000	125000		128000	128000	128000	
bsdet0400	6444624.76	6444624.76	6444624.76		6339859	6350228	6360622	
bsdet0600	19794185.09	19870749.66	19870749.66		19959921	19959921	19959921	
bsdet0700	12694052.05	5941460.93	5941460.93		13176309	8639064	8630960	
bsdet0900	139162610.1	137425607.8	136703208.5		139691047	137465632	136627040	
bsdet1200	185066.94	179742.79	179778.79		206755	199755	192755	
bsdet1300	8584176.47	8221651.63	8197295.61		8836788	8462917	8019973	
bsdet1500	357365599.8	365578955.4	365449199.9		344569298	348365682	352504465	
bsdet1700	5901518.13	5743420.9	5730766.78		7550131	7510183	7467607	
bsdet1800	0	0	0		.	.	.	
bsdet1900	-6763997.43	-6322886.98	-6314994.93		-6548706	-6468206	-6443859	
bsdet2100	1207701.57	1208078.98	1208078.98		1326014	1326014	1326014	
bsdet2200	4574635.65	4588950.31	4588950.31		4492404	4460378	4428368	
bsdet2300	4091011.3	4023950.47	4023950.47		4057253	3991253	3925253	

Figure 3. Sample Data Table for Computab Reporting

DATA REPORTING USING STORED PROCESSES AND COMPUTAB

PROC COMPUTAB is called through a stored process that uses a custom HTML input form. This input form lets the user choose the type of report desired and the month of the report. Figure 4 shows the input form used to determine the financial statement(s) to produce.

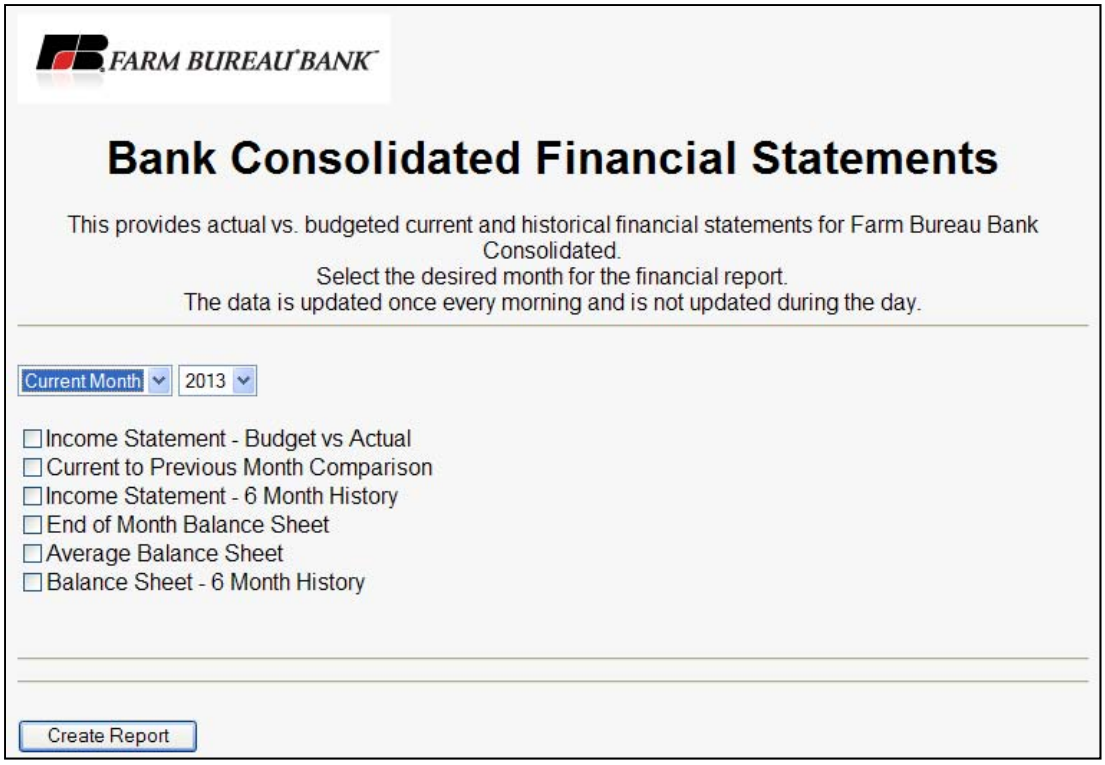

Figure 4. Stored Process Custom HTML Page

The stored process takes the month number, financial report(s) and year from the input form and uses those to create macro variables. These macro variables are then used to call the correct macro for the desired financial statement with the desired month actual and budgeted columns. PROC COMPUTAB works very well because it has the ability to compute rows or columns, thus allowing the totaling that is used for financial reports as well as creating the variance column.

```
%macro eombalsht;

Title1 'Farm Bureau Bank Consolidated';
Title2 'Balance Sheet End of Period';
Title3 "&curmonDate";
Title4 "Budget vs. Actual";
footnote1  h=2 j=l "Data updated as of: &LastUpdatedt &LastUpdatetm"  j=r " Run
Date: &date &tm";

proc computab data=Comp_data4  notrans out=budget_report;
rows bsdet0100/nozero ' '
"Assets"          '   Due From Banks' ;
rows bsdet0200/  '   Due From Banks - Interest Bearing' ;
rows bsdet0300/  '   Fed Funds Sold' ;
rows bsdet0400/  '   Mutual Funds' ;
rows bsdet0600/  '   Net Contracts Receivable' ;
rows bsdet0700/  '   Investment Securities' ;
rows bsdet0900/' '  '   Credit Card Loans' ;
rows bsdet1200/  '   Business Line of Credit' ;
rows bsdet1300/  '   Equipment Loans' ;
rows bsdet1500/  '   Installment Loans' ;
rows bsdet1700/  '   Mortgage Loans' ul;
rows totLoansGross/'    Total Loans' ;
.
.
```

```
columns  &histactmoncur BSE&reportyr.Bud&curmon curmonactbud / f=Comma13.0;
columns &histactmoncur BSE&reportyr.Bud&curmon curmonactbud/mtitle="&CurmonNM
&CurYear End of Period" ;
columns &histactmoncur  / 'Actual';
columns BSE&reportyr.Bud&curmon/ 'Budget';
columns curmonactbud/'Over (Under)' format=negparen13.0;

bsdet0100 = id = 'bsdet0100';
bsdet0200 = id = 'bsdet0200';
bsdet0300 = id = 'bsdet0300';
bsdet0400 = id = 'bsdet0400';
```

Figure 5. PROC COMPUTAB Macro

Figure 6 illustrates the balance sheet report produced by the stored process. As can be seen from the custom HTML page there are a number of other types of financial statements that could be produced. They all use the same base data, producing either a balance sheet or an income statement with the columns being determined by the type of financial statement selected. For each financial statement a separate macro is called that produces the desired statement.

Farm Bureau Bank Consolidated
Balance Sheet End of Period
January 31, 2013
Budget vs. Actual

	Jan 2013 End of Period		
	Actual	Budget	Over (Under)
Assets			
Due From Banks	,957	,441	,484)
Due From Banks - Interest Bearing	,722	,448	,726)
Fed Funds Sold	,000	,000	,000)
Mutual Funds	,625	,859	,766
Net Contracts Receivable	,185	,921	,736)
Investment Securities	,052	,309	,257)
Credit Card Loans	,610	,047	,437)
Business Line of Credit	,067	,755	,688)
Equipment Loans	,176	,788	,612)
Installment Loans	,600	,298	,302
Mortgage Loans	,518	,131	,613)
Total Loans	,971	,019	,952
Reserve for Loan Loss	,997	,706	,291)
Total Loans, Net	,974	,313	,661
FHLB Stock	,702	,014	,312)
Fixed Assets, Net	,636	,404	,232
Premium, Net	,011	,253	,758
Deferred Tax Asset	,996	,409	,587
Other Assets, Net	,402	,959	,443
Total Assets	,261	,330	,069)
Liabilities and Stockholders Equity			
Demand Deposits	,267	,928	,661)
Interest Bearing Demand Deposits	,579	,828	,751
MMDAs	,489	,806	,683
IRAs	,321	,440	,119)
Retail CDs	,754	,450	,696)
Retail Deposits	,409	,452	,043)
Brokered & Inst. CDs	,000	,628	,628)
CDARS	,334	,436	,102)
Total Deposits	,743	,516	,773)
FHLB Borrowings	,379	,402	,977
Interest Payable	,296	,226	,930)
Other Liabilities	,660	,327	,333
Total Liabilities	,077	,471	,394)
Stockholders Equity			
Common Stock	,000	,000	0
Surplus	,000	,000	0
Retained Earnings/(Deficit)	,850	,501	,349
Unrealized Gains/Losses on Sec	,334	,358	,024)
Total Stockholders Equity	,184	,859	,325
Total Liabilities and Stockholders Equity	,261	,330	,069)

Figure 6. Sample End of Month Balance Sheet

DAILY ACTUAL VS. BUDGETED EXPENSE REPORTING

Reports on the actual vs. budgeted expenses are reporting using OLAP cubes which gives the ability to drill down to the individual expenses. Also different hierarchies are created, so one can drill down by department to the line item or be line item to department.

DATA TRANSFORMATION

The actual data for the expenses is pulled from the general ledger through the data extraction. The individual transaction data for each of the accounts reported is run every night, resulting in the actual data being current as of the previous days financial processing. Budgeted data is determined using a separate system and an excel file is created with the budgeted data. The budgeted data has the same line items as the actual financials so that it can be used in the same manner as the actuals. The budget is loaded once when the budget is finalized and put into a permanent SAS table.

The budgeted and actual data descriptions and print order based upon the financial statements are assigned to the individual ledger transactions as shown in Figure 7. In addition, the department is put in based upon the full account number and the description as entered in the general ledger is added.

ledger	Report_desc	porder
511705	Occupancy	36
511805	Occupancy	36
512005	FF & E	37
512205	FF & E	37
512305	FF & E	37
512405	FF & E	37
512505	FF & E	37
512605	FF & E	37
513005	Supplies and Stationary	40
513010	Loan & Deposit Account Supplies	39
513015	Software	41
513020	Loan & Deposit Account Supplies	39
513025	Loan & Deposit Account Supplies	39
513205	Communications	42
513210	Communications	42
513215	Communications	42
513220	Communications	42
513405	Mkt and Adv	43
513410	Mkt and Adv	43

Figure 7. Table with Report Descriptions and Print Order

For the OLAP cube the actuals and the budgeted financial data is put into one table to allow the comparison by line item and department. That table is also used as a drilldown for the OLAP cube so the individual transaction that contributes to the amount can be examined if needed.

Report_desc	Deptnumname	ledger	description	Gldescription	porder	department	effect_dt	Actual	Budget	budget_actual
Mkt and Adv	661 - Deposit Products	513625	Printing	IMS	43	661	10/25/2012	$7,842.04	$0.00	Actual
Mkt and Adv	715 - Sales/Service	513625	Printing	Blue Tape, Inc JS	43	715	4/19/2012	$463.75	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	2/16/2012	$12,629.04	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	Clear Visions, Inc	43	721	2/16/2012	$26,459.28	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	TWG Solutions	43	721	2/16/2012	$17,311.36	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	Clear Visions, Inc	43	721	3/15/2012	$4,133.05	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	7/12/2012	$8,641.35	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	TWG Solutions	43	721	7/12/2012	$17,588.48	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	8/17/2012	$1,459.68	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	TWG Solutions	43	721	8/17/2012	$23,585.52	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	9/26/2012	$259.50	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	9/26/2012	$173.00	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	12/6/2012	$778.52	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	1/18/2013	$1,117.17	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	Clear Visions, Inc	43	721	2/7/2013	$8,271.60	$0.00	Actual
Mkt and Adv	721 - Marketing	513625	Printing	American Color Labs	43	721	2/27/2013	$2,080.32	$0.00	Actual
Mkt and Adv	741 - Secured Lending	513625	Printing	Blue Tape, Inc LC	43	741	7/5/2012	$143.82	$0.00	Actual
Mkt and Adv	741 - Secured Lending	513625	Printing	TWG Solutions	43	741	11/23/2012	$1,898.70	$0.00	Actual
Mkt and Adv	511 - Card Services	513635	Marketing Production	CC STMNT REWARD CREDITS	43	511	6/8/2012	($4,200.00)	$0.00	Actual
Mkt and Adv	511 - Card Services	513635	Marketing Production	REVERSE ENTRY 6-8-12	43	511	6/11/2012	$1,400.00	$0.00	Actual
Mkt and Adv	511 - Card Services	513635	Marketing Production	CC STMNT REWARD CREDITS	43	511	6/11/2012	$6,500.00	$0.00	Actual
Mkt and Adv	521 - Business Lending	513645	Media	Clear Visions, Inc	43	521	4/19/2012	$1,276.36	$0.00	Actual
Mkt and Adv	721 - Marketing	513645	Media	American Color Labs	43	721	11/23/2012	$3,480.10	$0.00	Actual
Mkt and Adv	721 - Marketing	513645	Media	American Color Labs	43	721	11/23/2012	$9,415.56	$0.00	Actual
Mkt and Adv	721 - Marketing	513645	Media	Clear Visions, Inc	43	721	11/23/2012	$749.28	$0.00	Actual
Fraud	741 - Secured Lending	518040	Fraud Expense - IL	budget_fcst	60	741	10/1/2012	$0.00	$7,500.00	Budget
Fraud	741 - Secured Lending	518040	Fraud Expense - IL	budget_fcst	60	741	11/1/2012	$0.00	$7,500.00	Budget
Fraud	741 - Secured Lending	518040	Fraud Expense - IL	budget_fcst	60	741	12/1/2012	$0.00	$7,500.00	Budget
Loan Expense	531 - Collections	518205	Collection/Repo Expense	budget_fcst	56	531	1/1/2012	$0.00	$6,000.00	Budget
Loan Expense	531 - Collections	518205	Collection/Repo Expense	budget_fcst	56	531	2/1/2012	$0.00	$6,000.00	Budget
Loan Expense	531 - Collections	518205	Collection/Repo Expense	budget_fcst	56	531	3/1/2012	$0.00	$6,000.00	Budget
Loan Expense	531 - Collections	518205	Collection/Repo Expense	budget_fcst	56	531	4/1/2012	$0.00	$6,000.00	Budget

Figure 8. Detail Table for OLAP Cube

Figure 8 shows a sample of the detail table that is used to create the cube for reporting. Hierarchies are created so one could drill down from the description such as **Printing** to the department and then to the individual line item as well as from the department to the description and then to individual line item. The print order is used to insure that the expenses appear in the same order as they do in the financial statements.

REPORTING

OLAP cubes are used for the reporting. This allows the manager to see all of the data and then drill down for a particular month and department or line item if desired.

Year					
Month			January		
Department	Description	Line Item	Actual	Budget	Difference
111 – Executive – Administration			60	68	8
331 – Farm Bureau Relations			11	14	3
341 – Facility Management – H. Pass			10	13	3
351 – Facility Management – Sparks			16	11	-1
	Employee Salaries		15	15	0
	Employee Benefits		16	17	1
	FF & E		11	11	0
	Supplies and Stationary		13	9	-1
	Software		10	12	2
	Communications		10	10	0
	Marketing and Advertising		12	9	-3
	Postage and Freight		-	-	-
411 – Finance/Accounting	Processing & Servicing Fees	514205 – Correspondent Bank Charges	17	10	-7
		514830 – Other Outside Services	10	10	0
	Professional Fees		9	10	1
	Conventions and Travel		-	-	-
	Dues and Memberships		-	-	-
	Publications & Subscriptions		15	10	-4
	Audit, Tax, & Examination Fees		18	19	1
	Travel & Entertainment		-	-	-
	Loan Expense		-	-	-
	Miscellaneous		-	-	-
421 – Enterprise Risk Management/Audit			11	16	5
431 – Accounting			13	12	-1
441 – Finance			18	17	-1
451 – HR			13	17	4
511 – Card Services (State Branches)			14	15	3
521 – Business Lending (BLOC)			12	13	1
531 – Collections			18	14	-4
611 – Operations			10	15	4
621 – Information Technology			16	14	-2

Figure 9. Sample OLAP Cube Report for Actual vs. Budget by Department

The field for the difference was calculated and it uses conditional highlighting to show whether the actual is greater or less than budget. This gives a department manager the ability to quickly see how his individual department is doing compared to budget. Because the table contains the individual items from the general ledger, if there is a question about an expense, that amount can be selected and the individual items from the underlying table will be show. This has proved particularly useful for the accounting area when they are checking expenses at the end of the month and for the managers when there is a question on one of the expenses. It also helps the managers determine if the expenses have been booked to the correct department and line item.

LOAN VOLUME TRACKING

The number of new accounts and the dollar amount of booked loans are tracked on a daily, monthly, quarterly and yearly basis. Loan data is pulled nightly from the banking and lending databases using batch processing. Many of the installment loan products originated by Farm Bureau Bank come in via referrals from Farm Bureau Insurance agents across the country. Each state has sales goals which are tracked by the same time periods listed previously. Therefore, it is necessary to provide state specific reports as well as an overall bank level breakdown by state and if the account was referred by a Farm Bureau Insurance agent.

REPORTING

Bank level loan reporting is accomplished using dashboards and linked stored processes. Figure 10 shows an example of how the bank tracks monthly loan volume. Metrics have been established that rank monthly loan volume as Below, On or Above Target. Using the red, yellow, green color scheme allows for quick comparison of current and previous period loan volume to established metrics.

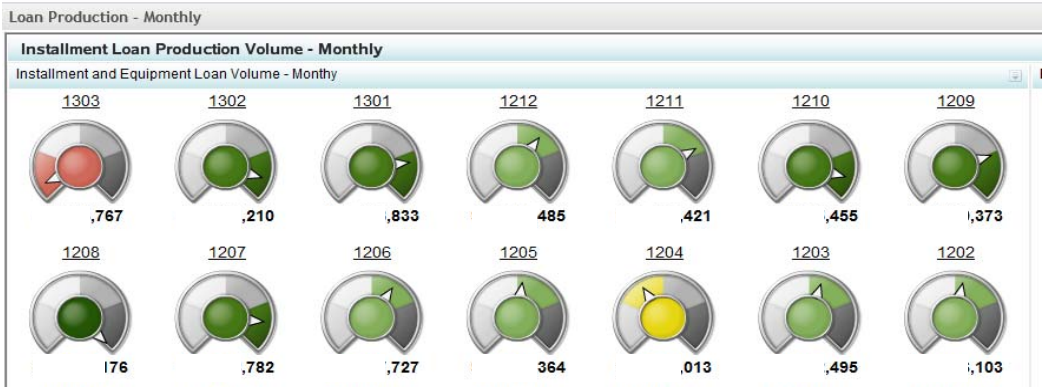

Figure 10. Sample Dashboard for Loan Volume Tracking

In order to provide more detailed information, the dials in Figure 10 are linked to a stored process that creates the report shown in Figure 11. This report allows for the management team to track individual stares and monitor the loan volume coming in through the various channels (By State and Referred v. Non-Referred).

Farm Bureau Bank
Loans for the Month of March 2013

State	Equipment Loans				Installment Loans				Total	
	Referred		Non-Referred		Referred		Non-Referred			
	#	$	#	$	#	$	#	$	#	$
AR		,181				,460				641
CT				,135						135
FL						,697				697
GA		,211				,855				066
IA								595		595
IN						,274				274
KY						,350		542		892
LA						,000		010		010
MN						,392				392
MS		,227				,545				772
NC		,075				,593		692		360
NE						,950				950
OK						,550				550
SC		,160				,386				546
TN								645		645
TX		,138				,655		396		189
VA						,053				053
Total		,992		,135		,760		880		767

Figure 11. Sample Report from Linked Stored Process

As well as monthly loan volume, the loan originations for the current month are projected based upon the daily average loan volume and the number of business days in the month. This is used by management for planning purposes to insure adequate funding of the loan volume.

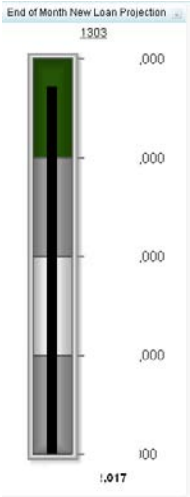

Figure 12. Projected Monthly Loan Volume

In addition to the dashboards and stored process reports designed for the management team, e-mails are sent to State representatives for Farm Bureau Insurance via the SAS Enterprise BI server (Figure 13). Sales goals

established between Farm Bureau Bank and State Representatives of Farm Bureau Insurance are tracked on a daily basis in order to judge the efficacy of state sales contests and promotions.

LA Daily Production Trash x

tscroggins@sasbi.farmbureaubank.com
to bcl km khai

Sales Goals as of Mar 11, 2013
Daily Production Report as of Mar 8, 2013

Month to Date Balances - .45
Monthly Goal - .27
Proj. Month End - .35
Proj. Monthly Results - .92

Year to Date Balance - .62
Yearly Goal - .00
Proj. Year End - 20
Proj. Yearly Results - .80

Figure 13. Sample E-mail for Individual State Production Goals

CONCLUSION

SAS Enterprise BI provides multiple means of producing and distributing analytical reports. Through the use of SAS Enterprise BI, Farm Bureau bank is able to create various reports that are updated daily to keep management informed of the current and projected operation condition of the bank.

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

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