Formatting Highly Detailed Reports: Eye-Friendly, Insight-Facilitating

Lisa Fine United BioSource Corporation

Introduction and Example

Consider a highly detailed report that is overwhelming with numbers

			Quarter 4	Quarter 1	Quarter 2
Region	Store #	Branch #	2010	2011	2011
East	1001	1	\$43,564	\$42,555	\$47,000
		2	\$47,235	\$47,523	\$48,102
		3	\$50,244	\$45,999	\$46,582
		4	\$37,665	\$37,778	\$39,624
			\$178,708	\$173,855	\$181,308
	1002	1	\$50,000	\$50,248	\$49,335
		2	\$48,045	\$46,822	\$48,000
		3	\$60,023	\$62,410	\$62,650
		4	\$55,000	\$56,102	\$56,109
		5	\$52,345	\$52,650	\$54,197
		6	\$56,444	\$57,720	\$57,800
		7	\$59,721	\$63,000	\$65,254
			\$381,578	\$388,952	\$393,345
	1003	1	\$67,443	\$66,230	\$67,503
		2	\$69,903	\$70,085	\$73,598
		3	\$57,900	\$60,000	\$62,900

Often, just slight changes in style and formatting can transform a report.

Regior	1: East						
0			2011 Sales				
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1	
Store #	Branch #						
1001	1	\$43,564	\$42,555	$\mathbf{\Psi}$	\$47,000	1	
	2	\$47,235	\$47,523	1	\$48,102	↑	
	3	\$50,244	\$45,999	V	\$46,582	↑	
	4	\$37,665	\$37,778	1	\$39,624	T	
		\$178,708	\$173,855	V	\$181,308	Ť	
1002	1	\$50,000	\$50,248	^	\$49,335	\mathbf{V}	
	2	\$48,045	\$46,822	↓	\$48,000	1	
	3	\$60,023	\$62,410	1	\$62,650	A	
	4	\$55,000	\$56,102	A	\$56,109		
	5	\$52,345	\$52,650		\$54,197	T	
	6	\$56,444	\$57,720		\$57,800	T	
	7	\$59,721	\$63,000	Ť	\$65,254	Ť	
		\$381,578	\$388,952	Ť	\$393,345	Ť	

Example Style Changes

- * Add white space between rows and columns.
- * Make key items stand out with
 - Bold font
 - Borders and underlines
 - Color

* Insert symbols, in this case arrows for quick reference

Region	Store #	Branch #	Quarter 4 2010	Quarter 1 2011	Quarter 2 2011
East	1001	1	\$43,564	\$42,555	\$47,000
		2	\$47,235	\$47,523	\$48,102
		3	\$50,244	\$45,999	\$46,582
		4	\$37,665	\$37,778	\$39,624
			\$178,708	\$173,855	\$181,308
	1002	1	\$50,000	\$50,248	\$49,335

Regio	1: East					
_				2011	Sales	
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
Store #	Branch #					
1001	1	\$43,564	\$42,555	4	\$47,000	1
	2	\$47,235	\$47,523	1	\$48,102	•
	3	\$50,244	\$45,999	↓	\$46,582	A
	4	\$37,665	\$37,778	1	\$39,624	A
		\$178,708	\$173,855	.↓	\$181,308	A
1002	1	\$50,000	\$50,248	↑	\$49,335	$\mathbf{\Psi}$

Base PROC REPORT Program

proc report data=sales nowd split="|" center missing
 style(column)=[just=c cellwidth=.8 in];

column REGION STORE BRANCH QTR4_2010 QTR1 QTR2;

define REGION / order "Region" style(column)=[cellwidth=.65 in];

define STORE / order "Store #" style(column)=[cellwidth=.65 in];

define BRANCH / order "Branch #"
 style(column)=[cellwidth=.7 in];

Base Program Cont...

define QTR4_2010 / "Quarter 4 2010" format=dollar10.;

define QTR1 / "Quarter 1 2011" format=dollar10.;

define QTR2 / "Quarter 2 2011" format=dollar10.;

** **Sum Sales per store;** break after STORE / summarize suppress;

run;

Apply Styling Changes

Display Region as Line Above Page

Region as Column				→	Region	as Line	
					Region: East		
Region	<u>Store #</u>	<u>Branch #</u>	2010 Sales <u>Quarter 4</u>		<u>Store #</u>	<u>Branch #</u>	2010 Sales <u>Quarter 4</u>
East	1001	1	\$43,564		1001	1	\$43,564
		2	\$47,235			2	\$47,235

Display Region as Line Above Page

** Specify ORDER and NOPRINT in DEFINE; DEFINE region / ORDER NOPRINT;

** Insert Page Break Before each Region; BREAK BEFORE region / PAGE;

** Add and Style Region Text; COMPUTE BEFORE __PAGE_; LINE "Region: " region \$20.; ENDCOMP;

Basic Line Statement (prior to applying style)

LINE "Region: " region \$20.;

\rightarrow	Region: East			
Store #	Branch #	2010 Sales Quarter 4		
1001	1	\$43,564		
	2	\$47,235		

Line Statement with Style Applied

```
COMPUTE BEFORE _PAGE_;

LINE "^S={FOREGROUND=blue

FONT_WEIGHT=bold

FONT_SIZE=16 pt

JUST=LEFT

}Region: " region $20.;
```

ENDCOMP;

\rightarrow	Region: East							
	<u>Store #</u>	Branch #	2010 Sales <u>Quarter 4</u>					
	1001	1	\$43,564					
		2	\$47,235					

Style Column Data

	Region: East							
	<u>Store #</u>	<u>Branch #</u>	2010 Sales <u>Quarter 4</u>					
\rightarrow	1001	1	\$43,564					
		2	\$47,235					

DEFINE store / ORDER "Store #"
 STYLE(COLUMN)=[CELLWIDTH=.65 in
 FOREGROUND=blue FONT_WEIGHT=bold];

DEFINE branch / ORDER "Branch #"
 STYLE(COLUMN)=[CELLWIDTH=.7 in
 FOREGROUND=blue FONT_WEIGHT=bold];

Page 12

Insert Columns of Colored Arrows

Region: East									
Store #	Branch #	2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1			
1001	1	\$43,564	\$42,555	•	\$47,000	1			
	2	\$47,235	\$47,523	1	\$48,102	1			

Derive Sales Difference Variables

** Difference Between Q1 2011 and Q4 2010; COMPUTE dir1;

dir1 = qtr1.SUM - qtr4_2010.SUM; ENDCOMP;

** Difference Between Q2 2011 and Q1 2011; COMPUTE dir2;

```
dir2 = qtr2.SUM - qtr1.SUM;
```

ENDCOMP;

Add Computed Variable Names to COLUMN Statement

COLUMN region store branch qtr4_2010 qtr1 dir1 qtr2 dir2;

Sales Difference Output

Store	Branch	2010 Sales				
#	#	Quarter 4	Quarter 1	DIR1	Quarter 2	DIR2
1001	1	\$43,564	\$42,555	-\$1,009	\$47,000	\$4,445
	2	\$47,235	\$47,523	\$288	\$48,102	\$579

Create Color Format

proc format; value COLOR low - < 0 = red 0 = black 0 < - high = green; run;

Style with Color Format, including Summary Lines

ENDCOMP;

Call Define Output

		2010 Sales				
Store #	Branch #	Quarter 4	Quarter 1	DIR1	Quarter 2	DIR2
1001	1	\$43,564	\$42,555	-\$1,009	\$47,000	\$4,445
	2	\$47,235	\$47,523	\$288	\$48,102	\$579

Turn Numbers into Arrows

** Create Arrow Hex Format, Apply Wingdings
Font;

proc format;

value ARROW

low - < 0 = "EA"x /** DOWN ARROW **/ 0 = "A2"x /** OPEN CIRCLE **/ 0 <- high = "E9"x; /** UP ARROW **/

run;

Apply Arrow Format, Specify Font_Face as Wingdings

DEFINE dir1 / COMPUTED
 FORMAT=arrow.
 STYLE(COLUMN) =
 [CELLWIDTH=.6 in
 FONT FACE=wingdings];

DEFINE dir2 / COMPUTED

FORMAT=arrow.

STYLE (COLUMN) =
[CELLWIDTH=.6 in
FONT FACE=wingdings];

Wingdings Font Face Applied

		2010 Sales				
Store #	Branch #	Quarter 4	Quarter 1	DIR1	Quarter 2	DIR2
1001	1	\$43,564	\$42,555	\rightarrow	\$47,000	
	2	\$47,235	\$47,523	1	\$48,102	^

Add Spanning Header (2011 Sales) and Bottom Cell Borders

Region: East

				2011	Sales	
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
Store #	Branch #					
1001	1	\$43,564	\$42,555	$\mathbf{\Psi}$	\$47,000	1
	2	\$47,235	\$47,523	1	\$48,102	1

2011 Calar

Spanning Headers

2011 Sales





Add Bottom Cell Borders

		2011	Sales	
2010 Sales				
Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
\$43,564	\$42,555	↓	\$47,000	1

**** Enclose desired text in ^{STYLE} function;** COLUMN region store branch qtr4_2010

```
("^{STYLE [BORDERBOTTOMWIDTH = 1 pt] 2011 Sales}"
  ("^{STYLE [BORDERBOTTOMWIDTH = 1 pt] Quarter 1}" qtr1)
  ("^{STYLE [BORDERBOTTOMWIDTH = 1 pt] Vs. Q4}" dir1)
  ("^{STYLE [BORDERBOTTOMWIDTH = 1 pt] Quarter 2}" qtr2)
  ("^{STYLE [BORDERBOTTOMWIDTH = 1 pt] Vs. Q1}" dir2)
);
```

Underline Headers

DEFINE store / ORDER

"^S={TEXTDECORATION=UNDERLINE}Store #"
STYLE(COLUMN)=[CELLWIDTH=.65 in
FOREGROUND=blue FONT WEIGHT=bold];

DEFINE branch / ORDER "^S={TEXTDECORATION=UNDERLINE}Branch #" STYLE(COLUMN)=[CELLWIDTH=.7 in FOREGROUND=blue FONT WEIGHT=bold];

Set headers to null in DEFINES

DEFINE qtr4_2010 / ANALYSIS "" FORMAT=DOLLAR10.; DEFINE qtr1 / ANALYSIS "" FORMAT=DOLLAR10.;

- DEFINE dir1 / COMPUTED "" STYLE(COLUMN)=[FONT_FACE=wingdings CELLWIDTH=.6 in] FORMAT=arrow.;
- DEFINE qtr2 / ANALYSIS "FORMAT=DOLLAR10.;
- DEFINE dir2 / COMPUTED "" STYLE(COLUMN)=[FONT_FACE=wingdings CELLWIDTH=.6 in] FORMAT=arrow.;

Add Blank Columns

Region: East

				2011	Sales	
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
<u>Store #</u>	Branch			1		
1001	1	\$43,564	\$42,555	↓	\$47,000	1
	2	\$47,235	\$47,523		\$48,102	1
	3	\$50,244	\$45,999	🔶 🗸	\$46,582	1
	4	\$37,665	\$37,778	1	\$39,624	1
		\$178,708	\$173,855	\mathbf{V}	\$181,308	1

Steps to Add Blank Columns

- Create "BLANK" variable in data set.
- Add the new variable to the COLUMN statement in places for which a blank column is desired.
- Specify null label and the desired cell width for each blank column in the DEFINE statement.

Create "BLANK" variable in data set

** Add "BLANK" variable to the SALES data set; data sales; set sales; blank = ""; run;

Add BLANK to the COLUMN statement where ever a blank column is desired

** Add BLANK to COLUMN Statement in Desired Locations; COLUMN region store branch BLANK

** Add Bottom Cell Borders And Create A Spanning Header; ("2010 Sales|^{style [borderbottomwidth=1 pt]Quarter 4}" QTR4_2010) BLANK ("^{style [borderbottomwidth=1pt] 2011 Sales}" ("^{style [borderbottomwidth=1pt] Quarter 1}" QTR1) ("^{style [borderbottomwidth=1pt] Vs. Q4}" dir1) BLANK ("^{style [borderbottomwidth=1pt] Quarter 2}" QTR2) ("^{style [borderbottomwidth=1pt] Vs. Q1}" dir2));

Add BLANK DEFINE statement with null header and desired column width

define BLANK / "" style(column)=[cellwidth=.15 in];

Style / Add Blank Line After each Summary Line

Region: East

			2011 Sales			
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
Store #	Branch #					
1001	1	\$43,564	\$42,555	↓	\$47,000	1
	2	\$47,235	\$47,523	1	\$48,102	1
	3	\$50,244	\$45,999	↓	\$46,582	1
	4	\$37,665	\$37,778	1	\$39,624	1
		► \$178,708	\$173,855	↓	\$181,308	↑ ↑ ↓
1002	1	\$50,000	\$50,248	↑	\$49,335	¥
	2	\$48,045	\$46,822	V	\$48,000	1
	3	\$60,023	\$62,410	1	\$62,650	A
	4	\$55,000	\$56,102	A	\$56,109	A
	5	\$52,345	\$52,650	A	\$54,197	A
	6	\$56,444	\$57,720	A	\$57,800	A
	7	\$59,721	\$63,000		\$65,254	Ť
		▶ \$381,578	\$388,952	1	\$393,345	1

Styling Summary Line and Adding Blank Line

- Summarize with a BREAK statement (this was done for the unformatted report as well). Apply bold blue font to the summary lines.
- Further highlight the totals by adding a blank line after the last value of each Store #.

Style Summary Line, Add Blank Line

** Apply Bold Blue Font to Summary Lines; break after STORE / summarize suppress style(summary)=[font_weight=bold foreground=blue];

** Add Blank Line after each store # group; compute after STORE; line " "; endcomp;

Recap of Modifications

- Region was displayed as a line above each report page, rather than as a column on each page.
- Store #s and Branch #s were displayed in bold blue font (font color is called "foreground" in the SAS® code).
- Arrows were displayed to provide a quick reference to whether sales increased or decreased from the previous quarter.

Recap Cont...

- Color was applied to the arrows to further highlight increases (green), decreases (red), and no change (black).
- A spanning header, "2011 Sales" and bottom borders and underlines were added to header cells.
- Summary lines, which show total Store sales, were brought out by applying blue font and adding a blank line after each summary line.
- Blank columns were added after the following columns: "Branch #", "2010 Sales Quarter 4", and after "Vs Q4".

Regio	n: East					
-				2011	Sales	
		2010 Sales Quarter 4	Quarter 1	Vs. Q4	Quarter 2	Vs. Q1
Store #	Branch #					
1001	1	\$43,564	\$42,555	$\mathbf{\Psi}$	\$47,000	Vs. Q1 ↑ ↑ ↑ ↑ ↑ ↑ ↑
	2	\$47,235	\$47,523	1	\$48,102	Vs. Q1 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑
	3	\$50,244	\$45,999	↓	\$46,582	1
	4	\$37,665	\$37,778	1	\$39,624	1
		\$178,708	\$173,855		\$181,308	Vs. Q1 ↑ ↑ ↑ ↑ ↑ ↑
1002	1	\$50,000	\$50,248	^	\$49,335	¥
	2	\$48,045	\$46,822	i	\$48,000	1
	3	\$60,023	\$62,410	Vs. Q4 Quarter ↓ \$47,00 ↓ \$44,00 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$46,58 ↓ \$49,33 ↓ \$49,33 ↓ \$48,00 ↓ \$62,65 ↓ \$56,10 ↓ \$57,80 ↓ \$57,80 ↓ \$65,25	\$62,650	
	4	\$55,000	\$56,102	A	\$56,109	
	5	\$52,345	\$52,650	Ť	\$54,197	
	6	\$56,444	\$57,720	Ť	\$57,800	A
	7	\$59,721	\$63,000	1	\$65,254	•
		\$381,578	\$388,952	T	\$393,345	1

			Quarter 4	Quarter 1	Quarter 2
Region	Store #	Branch #	2010	2011	2011
East	1001	1	\$43,564	\$42,555	\$47,000
		2	\$47,235	\$47,523	\$48,102
		3	\$50,244	\$45,999	\$46,582
		4	\$37,665	\$37,778	\$39,624
			\$178,708	\$173,855	\$181,308
	1002	1	\$50,000	\$50,248	\$49,335
		2	\$48,045	\$46,822	\$48,000
		3	\$60,023	\$62,410	\$62,650
		4	\$55,000	\$56,102	\$56,109
		5	\$52,345	\$52,650	\$54,197
		6	\$56,444	\$57,720	\$57,800
		7	\$59,721	\$63,000	\$65,254
			\$381,578	\$388,952	\$393,345
	1003	1	\$67,443	\$66,230	\$67,503
		2	\$69,903	\$70,085	\$73,598
		3	\$57,900	\$60,000	\$62,900

Contact Information

Lisa Fine United BioSource Corporation Lisa.Fine@ubc.com