

Improving Performance with SKU Analysis

A Step-by-Step Guide to Creating a SKU Analysis

Accelerated Analytics [®]



Improving Performance with SKU Analysis

Objectives

The objectives of conducting a SKU analysis are:

1. To identify the subset of SKU's that have the highest contribution to total sales. Sales of products are always unequal and some contribute more to total sales than others. By identifying the highest contributing SKU's, you can focus improvement efforts where they will have the largest impact.
2. To categorize the highest contributing SKU's for use in out of stock analysis and forecasting. As stated in other articles in this series, a key objective is to limit the amount of data that needs to be analyzed when you do item and store level planning. By identifying the highest contributing SKU's, you can limit the row counts to the number of total stores for each SKU identified. For example, if you sell one item at 1900 stores, but the item contributes a very small percentage to total sales, you can eliminate that SKU and the accompanying 1900 rows of data with minimal impact to effectiveness.



The key metrics for a SKU analysis are: units sold per store and the percentage change in units sold for the comparable prior year period. These two metrics allow for accurate cross SKU comparisons.

Key Considerations

A SKU analysis is best done by comparing units sold because it factors out the variance between the prices of different items. Otherwise, if you were comparing two items which both sold 100 units, but had prices of \$5 and \$15, the gross dollars will provide a misleading conclusion that the \$15 item is a better seller when in fact they are selling at the same rate. However, if you are able to apply a gross margin, then dollars-based analysis can be very useful since analysis could be done on a percentage of gross profit.

Using units sold per store is useful because it eliminates the sales volume variance due to differing store counts. An alternative approach is to analyze one plan-o-gram set at a time for the stores that carry that plan-o-gram. This will hold the store count constant for analysis.

It is useful to calculate the percentage change in units sold for the comparable prior year period at a store level because it indicates if a SKU is growing or declining. When the SKU category is assigned at the end of this analysis, we will use a composite ranking of both units sold per store and growth to identify the best SKU's.



Improving Performance with SKU Analysis

Step-By-Step Construction

1. Determine Units Sold and Store Count

To set-up your analysis, pull a table of data for your SKU's with units sold and store count for each of your SKU's. The store count can be based on:

- Stores which sold the SKU during the two periods,
- The plan-o-gram store count, or
- Stores that sold the item or had OH indicating they had the opportunity to sell the item

In most situations, the most common method for store count will be by plan-o-gram count or by considering both units sold and OH. Choose two comparable periods, either YTD with a corresponding period from the prior year or a full year-over-year comparable. To be most accurate, use a full year of history. This SKU analysis requires comparable year-over-year sales, so new SKU's introduced during the analysis period should be eliminated. Review the data table to see if any SKU's were selling in one period and not the other and delete those SKU's. *See Figure 1.*

FIGURE 1

SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT
149446	350,404	526,197	3,613	1,926
156743	354,340	490,015	3,640	1,929
126500	498,781	562,918	3,111	1,962
154787	165,356	304,218	2,040	1,904
576727	193,729	249,882	3,097	1,954
338796	162,050	213,967	3,041	1,955
126195	117,776	185,001	3,091	1,883
126551	437,531	414,515	3,107	1,959
200212	689,444	669,596	2,831	1,964
126217	74,070	104,352	3,043	1,955

2. Calculate Units per Store (UPS)

Calculate the units per store (UPS) by dividing the total units sold by the store count. Do this for both periods. The calculated UPS is the most useful way to compare the performance of SKU's across two different periods of time because it eliminates store count as a variable. *See Figure 2.*

Improving Performance with SKU Analysis

FIGURE 2



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS
149446	350,404	526,197	3,613	1,926	97	273.2
156743	354,340	490,015	3,640	1,929	97	254.0
126500	498,781	562,918	3,111	1,962	160	286.9
154787	165,356	304,218	2,040	1,904	81	159.8
576727	193,729	249,882	3,097	1,954	63	127.9
338796	162,050	213,967	3,041	1,955	53	109.4
126195	117,776	185,001	3,091	1,883	38	98.2
126551	437,531	414,515	3,107	1,959	141	211.6
200212	689,444	669,596	2,831	1,964	244	340.9
126217	74,070	104,352	3,043	1,955	24	53.4

3. Calculate Percentage Change in Units

Calculate the percentage change in units sold per store using the formula:

$$\frac{\text{Current period} - \text{Prior period}}{\text{Prior period}}$$

This calculated percentage change will indicate if the SKU is growing or declining and has factored out the store count for accurate comparison. *See Figure 3.*

FIGURE 3



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%

Improving Performance with SKU Analysis

4. Calculate Percentage of Total Units Sold by SKU

For each SKU, calculate the percentage of total units sold that the SKU is contributing. This is done by dividing the SKU's units sold by the total units sold. This column can be used later when you identify the most useful SKU's to use for forecasting and out of stock analysis. In general, if a SKU is contributing less than half the median, it is not worth including the analysis. For example, if the median percentage to total is 1.5%, then any SKU not adding at least 0.75% to the total can be excluded. *See Figure 4.*

FIGURE 4



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	% TTL US
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%

5. Calculate Cumulative Percentage to Total

The next column to be calculated is the cumulative percentage to total. This allows you to scan down the column to determine which SKU's comprise an important percentage of total sales. For example, in Figure 5, we can see the top 10 SKU's are contributing 37.7% of the total sales. *See Figure 5.*

FIGURE 5



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	% TTL US	CUM % TTL US
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%	10.3%
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%	16.0%
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%	19.1%
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%	21.6%
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%	23.8%
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%	25.6%
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%	29.8%
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%	36.6%
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%	37.7%

Improving Performance with SKU Analysis

6. Rank Each SKU by Units Sold per Store

The next step is to rank each SKU by units sold per store. This can be done easily by sorting the SKU table by the units sold per store for the current period and then simply filling 1 to x down the new UPS rank column. *See Figure 6.*

FIGURE 6



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	% TTL US	CUM % TTL US	UPS Rank
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%	6
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%	10.3%	8
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%	16.0%	5
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%	19.1%	12
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%	21.6%	14
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%	23.8%	18
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%	25.6%	20
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%	29.8%	10
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%	36.6%	3
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%	37.7%	30

7. Calculate Units per Store Percentage Change Rank

Next calculate the units per store percentage change rank. This is done by sorting the data table by the percentage change in units per store column. Then simply fill the new rank column 1 to x down. *See Figure 7.*

FIGURE 7



SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	% TTL US	CUM % TTL US	UPS Rank	UPS % Chg Rank
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%	6	2
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%	10.3%	8	3
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%	16.0%	5	13
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%	19.1%	12	9
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%	21.6%	14	7
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%	23.8%	18	6
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%	25.6%	20	4
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%	29.8%	10	19
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%	36.6%	3	30
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%	37.7%	30	5

8. Create Composite Rank

Because you want to rank SKU's by both units sold per store and growth, the next step is to create a composite rank using the UPS rank and UPS % Chg rank columns. To do this, sum the two rank columns together. Then sort the table by the new composite rank ascending. The lowest number in the composite rank column will be 2. Therefore, to create a clean ranking with values starting at 1 and increasing to your total SKU count, you will need to create a new column and fill from 1 to x down that column. After this has been done, you can delete the calculated composite rank column.

Improving Performance with SKU Analysis

This method of composite ranking produces a more valid SKU by SKU comparison. In Figure 8a, for example, see how SKU 198373 is ranked number 1 in units per store, but 45 in units per store percentage change; SKU 149446 is ranked sixth in units per store and number 2 in units per store percentage change. *See Figure 8a.*

FIGURE 8a

SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	%TTL US	CUM%TTL US	UPS Rank	UPS% Chg Rank	Composite Rank	SKU CATEGORY
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%	6	2	1	A
198373	982,038	857,715	2,838	1,966	346	436.3	26.1%	8.7%	14.0%	1	45	17	A

By using the composite ranking method, SKU 149446 is more correctly ranked above 198373 because it is a good performer in both units per store, and it is showing year-over-year growth in units per store. *See Figure 8b.*

FIGURE 8b

SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	%TTL US	CUM % TTL US	UPS Rank	UPS % Chg Rank	Composite Rank	SKU CATEGORY
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%	6	2	1	A
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%	10.3%	8	3	2	A
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%	16.0%	5	13	3	A
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%	19.1%	12	9	4	A
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%	21.6%	14	7	5	A
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%	23.8%	18	6	6	A
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%	25.6%	20	4	7	A
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%	29.8%	10	19	8	A
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%	36.6%	3	30	9	A
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%	37.7%	30	5	10	A

9. Categorize Each SKU

The end result of the analysis is to categorize each SKU in an A, B, C, or D category. This is most easily done by dividing the total number of SKU's in your data table by four. For example, if you have 100 SKU's, the first 25 will be A SKU's and the next 25 will be B SKU's. *See Figure 9.*

FIGURE 9

SKU	2008 UNITS SOLD	2009 UNITS SOLD	2008 STORE COUNT	2009 STORE COUNT	2008 UPS	2009 UPS	% Chg UPS	%TTL US	CUM % TTL US	UPS Rank	UPS % Chg Rank	Composite Rank	SKU CATEGORY
149446	350,404	526,197	3,613	1,926	97	273.2	181.7%	5.3%	5.3%	6	2	1	A
156743	354,340	490,015	3,640	1,929	97	254.0	161.0%	5.0%	10.3%	8	3	2	A
126500	498,781	562,918	3,111	1,962	160	286.9	79.0%	5.7%	16.0%	5	13	3	A
154787	165,356	304,218	2,040	1,904	81	159.8	97.1%	3.1%	19.1%	12	9	4	A
576727	193,729	249,882	3,097	1,954	63	127.9	104.4%	2.5%	21.6%	14	7	5	A
338796	162,050	213,967	3,041	1,955	53	109.4	105.4%	2.2%	23.8%	18	6	6	A
126195	117,776	185,001	3,091	1,883	38	98.2	157.8%	1.9%	25.6%	20	4	7	A
126551	437,531	414,515	3,107	1,959	141	211.6	50.3%	4.2%	29.8%	10	19	8	A
200212	689,444	669,596	2,831	1,964	244	340.9	40.0%	6.8%	36.6%	3	30	9	A
126217	74,070	104,352	3,043	1,955	24	53.4	119.3%	1.1%	37.7%	30	5	10	A

Improving Performance with SKU Analysis

10. Create Executive Summary

A very good way to summarize the SKU performance for management and retail buyers can be seen in Figure 10. The top two tables provide the top and bottom SKU's based on the composite SKU ranking. These tables are easily added by taking the top 10 SKU's in your sorted data table and the bottom 10 SKU's in your data table.

Next summarize the percentage of sales each SKU category contributes to total sales by summing the sales for each category and then calculating the percentage of total SKU's. This provides an effective visual way to apply *Pareto's Principle* of 80/20 and find the most important set of SKU's.

Because average units per store is also a key metric, we added a graph which charts the average units sold per store for each SKU category.

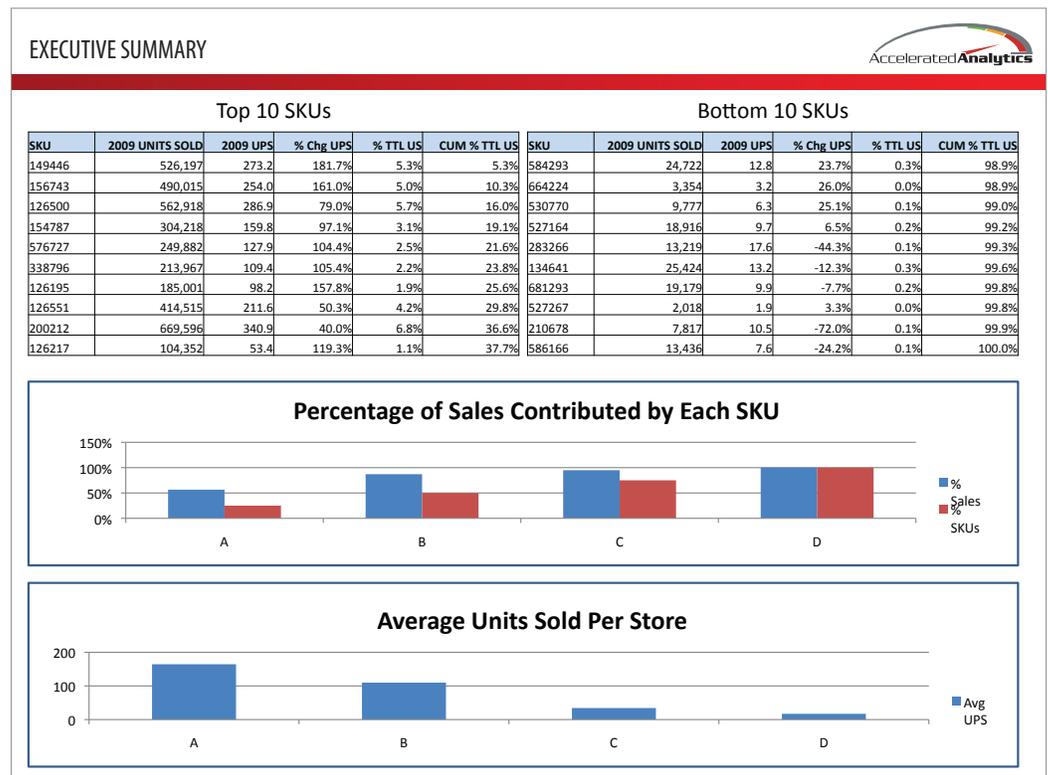
From your analysis, you can clearly see that about half of the SKU's contribute more than 80% of total sales. You now know that if you limit future SKU forecasting and detailed analysis to A and B SKU's, you will be analyzing the items responsible for more than 80% of total sales while reducing the number of SKU's to be analyzed by 56%. This method focuses the analysis on the most critical set of SKU's and greatly reduces the volume of data to be analyzed. *See Figure 10.*



Pareto's Principle:
An Italian economist,
Vilfredo Pareto created

a mathematical formula that described the unequal distribution of wealth that he observed and measured in his country. Pareto observed that roughly 20% of the people controlled or owned 80% of the wealth. In the late 1940's, Dr. Joseph Juran, a quality management expert, attributed the 80/20 rule to Pareto calling it Pareto's Principle. Dr. Juran described how 20% of a set is generally responsible for 80% of the results, and described his observation as the "vital few and trivial many."

FIGURE 10



Improving Performance with SKU Analysis

Next Steps

This analysis is one in a series of articles that provides step-by-step guidelines to creating reports and analyses that can help you better understand and improve SKU and store performance. The series includes the following articles:

- Store Analysis
- SKU Analysis
- Out of Stock Analysis
- SKU Forecast

To download additional articles in this series, visit www.acceleratedanalytics.com.

About Accelerated Analytics, LLC

Accelerated Analytics® is a comprehensive software-as-a-service (SaaS) solution for collecting, analyzing, and reporting on retail EDI 852, POS, and supply chain data. Accelerated Analytics includes rich web based analytics and mobile access so that business users can focus on growing profitable sales, reducing out of stocks, and optimizing assortments. Accelerated Analytics tools provide years of best practices in retail merchandising and are customizable to your exact requirements.



For more information, visit www.AcceleratedAnalytics.com