The Art of Accurate Reports
(with Examples from SAS® Enterprise Guide®)

By Victoria Garcia
Florida Fish and Wildlife Conservation Commission
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Abstract: Many times, we find ourselves with an overwhelming amount of data at our fingertips. The goal of this paper is to aid the user in creating accurate reports in SAS Enterprise Guide in a simple top-down approach using four steps; Envisioning, Planning, Creating, then Testing. For this paper, we will be working data from the Florida Fish and Wildlife Conservation Commission.
Write out what you want your report to look like down to the nitty gritty.

Systems can be huge and complex like a clock. One gear can depend on another. Be sure that you are using the correct one!

Know your data:

- **Column Name**: Cust_ID
  - **Type**: char
  - **Description**: Customer ID

- **Column Name**: Residency
  - **Type**: char
  - **Description**: Displays if customer is resident or non

- **Column Name**: Generation
  - **Type**: char
  - **Description**: Generation customer falls into. Baby boomer, Millennial, etc.

- **Column Name**: Gender
  - **Type**: char
  - **Description**: Male, Female, Other
Plan

Which Data Sets
With help from the Data Dictionary, decide which data sets you need to use. Use caution when using multiple sets, as you don’t want the same information twice.

“Think twice, Code once”
There’s an old saying when it comes to programming and it’s “Think Twice, Code Once”. It means you should plan before you code. This applies to creating accurate reports.

In your notepad, write out a plan. Carefully, step by step, put an imaginary process flow into words.
**Tip #1. Finding Duplicates**
Removing duplicates is easy. Simply use the ‘Select distinct rows only’ in the Query Builder.

But what if you want to find how many times an item appears in the data?

Then the COUNT function is your best friend. Here we are counting how many unique customers appear in our data.

**Tip #2. The WHEN statement**
The WHEN statement is incredibly can be used in so many scenarios for example.
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Test

The Checklist

☐ Compare your report to information from the system(s) you are working in. It’s always good to make sure your report accurately reflects the system.

☐ Ask a co-worker if it the report makes sense. Now, I’m not talking about just any co-worker; try to find one that is familiar with the system.

Red flags include comments like: “That seems a bit inflated/deflated.”

“... Are you sure?”

and “I think you’re completely wrong.”

☐ Take a break. Either it be 15 minutes or a day. Just give yourself time to refresh. When you return, read your notes over.

☐ Compare your data to your data. Meaning, create another report in a different way that verifies the first report.
1. Envision your report
   - Layout and format
   - Not everything is as it seems (Using the data dictionary)
   - Know your Data
2. Plan your report
   - Which data sets to use
   - Write it out – “Think twice, Code once”
3. Create your report
   - Tips and Tricks (Finding duplicates, the WHEN statement)
4. Test your report
   - The checklist

Abstract:
Many times, we find ourselves with an overwhelming amount of data at our fingertips. The goal of this paper is to aid the user in creating accurate reports in SAS Enterprise Guide in a simple top-down approach using four steps; Envisioning, Planning, Creating, then Testing. For this paper, we will be working data from the Florida Fish and Wildlife Conservation Commission.

Step 1. Envision your report
The first step to creating an accurate report is knowing what you want and how you want it. You might be tempted to skip this step. You might say “Of course I know what I want!” then start building. I assure you, this step is vital. Having a solid vision of what you want keeps you on track.
   - Layout and Format:

      Start with a notepad, virtual or not. Type in the name of your report then the columns you want, even if the columns don't exist in the data you are working with. Below the columns, write the format that suits each one if at all. Remember that raw data doesn’t have commas or dollar signs. For columns that do not exist in the data, define them.

      For this report, I have been asked to show how many and what type of licenses were sold to resident senior citizens in 2016.
• **Not everything is as it seems. Using the Data Dictionary:**

Now that you know what you want and how you want it. It’s time to know what you have. Most systems have a **Data Dictionary**. This nifty file contains descriptions of each column in your dataset. Any good SAS System Administrator has one, ask yours! It could look like the one below or a bit different. If you have the Column names and Definitions, then you are golden.

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Type</th>
<th>Length</th>
<th>Null</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACHInputFileId</td>
<td>int</td>
<td>4</td>
<td>No</td>
<td>Unique ACH Input File id.</td>
</tr>
</tbody>
</table>

**RLIS Replicated Data Dictionary**

**ACHInputFile**

Stores the ACH input files generated by Brandt.

• **Know your data:**

Systems can be huge and complex like a clock. One gear can depend on another. Using the Data Dictionary, look at your tables then ask yourself “What is this table used for?” and “How do they work together?”.

Note: The data provided to you in SAS might not be the same one used in the system. There can be hundreds of tables in a system. Instead of sifting through all of them, your SAS Systems Administrator might have created a couple tables for you to use!
Step 2. Plan your Report:

- **Which data sets to use:**

  For the report mentioned in step one, I have chosen two sets; a table that contains all orders from 2016 and a table that contains current customers. There are other tables available but these two contain all the information that I need, no more, no less.

  Note: Use caution when using multiple tables as you might miss the same information twice.

- **Write it out – “Think twice, Code once”:**

  There’s an old saying when it comes to programming and it’s “Think Twice, Code Once”. It means you should plan before you code. When writing a complex program with hundreds of lines of code, poor planning could lead to disaster like having to write the program all over again; resulting in hours of wasted time. Now, we aren’t coding but this saying applies to a lot of things in life and it certainly applies to creating an accurate report.

  In your notepad, write out a plan. Carefully, step by step, put an imaginary process flow into words.
Step 3. Create your report:

Now, follow your brilliant plan! By writing it out, you have already worked out any kinks that you would have run into otherwise. If you add extra filters or do something that isn’t in the plan, be sure to add it to your notepad. You are not only writing for your future self, but for others to follow behind you.

- Tip #1. Finding Duplicates

Removing duplicates is easy, you could simply use the ‘Select distinct rows only’ in the Query
But what if you want to find how many times an item is appears in the data? Ladies and Gentlemen, the COUNT function. In the below picture we are using the COUNT function to count how many times a customer ID appears in the data. We changed the group by settings to group by customer ID.

**Note:** To find how many times a customer with a specific license type appears in the data then we would add ‘licenseTypeld’ to groups. If you are new to creating calculated columns the first and most important thing to familiarize yourself with all the different functions.

- **Tip #2. The WHEN statement**

The WHEN statement is incredibly versatile. The WHEN statement is used when you want to replace one value with another but only when that value meets certain conditions. Just remember to add `case, when, then, else, end`.

Example 1. We want to create a column for the different generations our customers fall into:
Example 2. We want to replace all missing values in our column with zeros:

Step 4. Test your Report

The last but certainly not least step. Testing your report. You have gone through the steps precisely and confident that your report is accurate. However, no matter how certain you are there’s always a chance of making mistakes. We’re human after all.

- **The Checklist:**
  - Compare your report to information from the system you are working in. It’s always good to make sure your report accurately reflects the system.
  - Ask a co-worker if it the report makes sense. Now, I’m not talking about just any co-worker; try to find one that is familiar with the system.
    Red flags include comments like:
    “That seems a bit inflated/deflated.”
    “… Are you sure?”
    and “That seems way off.”
  - Take a break. Either it be 15 minutes or a day. Just give yourself time to refresh. When you return, read your notes over.
Compare your data to your data. This might sound silly, but try to create another report that should logically reflect the report you created first. Example, for our report of finding how many senior customers purchased a license in 2016; create a table that counts and sums the distinct number of senior customers from that year. The rows should match.

Thank you!

Contact Information
Victoria Garcia
Florida Fish and Wildlife
Victoria.Garcia@myfwc.com

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