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## **ReportNet Technical Best Practices:**

Time Period Analysis

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Credits: "Modeling for relative time" by Paul Prieto

## Change Control

Date	Version	Author	Change Description
1/17/2005	1.0	Rob Hofstetter	Initial draft complete
2/1/2005	1.1	Rob Hofstetter	Reworded the somewhat confusing comparison of current time period analysis versus analysis of any time period.

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## Introduction

A common request I encounter when visiting clients is the need to perform many calculations based upon dates. These calculations are typically year-to-date or running-12-months style calculations. This is something that competitive products have coded for within their toolset. What is not commonly known is that there is a fairly simple database driven approach to handle these requests. Based upon Paul Prieto's paper entitled "Modeling for relative time", I will demonstrate this approach extending it for a specific need to handle analysis for any period. This will likely require prompting or filtering the result set to a specific period. The requirements of the project should be weighed to determine if multi-period analysis is really necessary. If not then a single period approach might be a better fit.

## Prerequisites

As this is a technical ReportNet topic, anyone wishing to apply this approach to existing models should already be experienced with Framework Manager modeling as well as Query Studio and Report Studio authoring. Individuals should consider attending *Cognos ReportNet Metadata Modeling*, *Cognos ReportNet Ad Hoc Querying*, *Cognos ReportNet Introduction to Report Authoring*, and *Cognos ReportNet Intermediate Report Authoring* courses offered by Cognos. Refer to Cognos Training Services at <http://support.cognos.com/en/training/index.html> for course schedules. The included scripts and model rely on the Go Data Warehouse samples using ReportNet 1.1 MR2.

## Approach

The following series of steps have been designed for the Go Data Warehouse model and database which are among the distributed samples. Throughout the demonstration changes are applied to both so customary backups should be performed. The goal here is to provide efficient database driven time period analysis. The samples are based upon a very small set of data for which minimal tuning has been performed. In a real-world scenario this type of aggregation could take several minutes without the use of summary tables and would require more focus on tuning the database for these types of queries.

## Transformation Table

The single most important aspect of this technique is the use of a transformation table to transpose a range of dates into a time category (i.e. YTD or PYTD). The primary consideration when determining the layout of this table is whether or not there is a need to report on multiple periods versus solely based upon the current period. Having time categories based only on the current period means having only one YTD representing the current year up until today. Designing the driving table around the exact need makes report design more simplistic and execution more efficient. An example layout of a transformation table used strictly for current period analysis would look like figure 1.

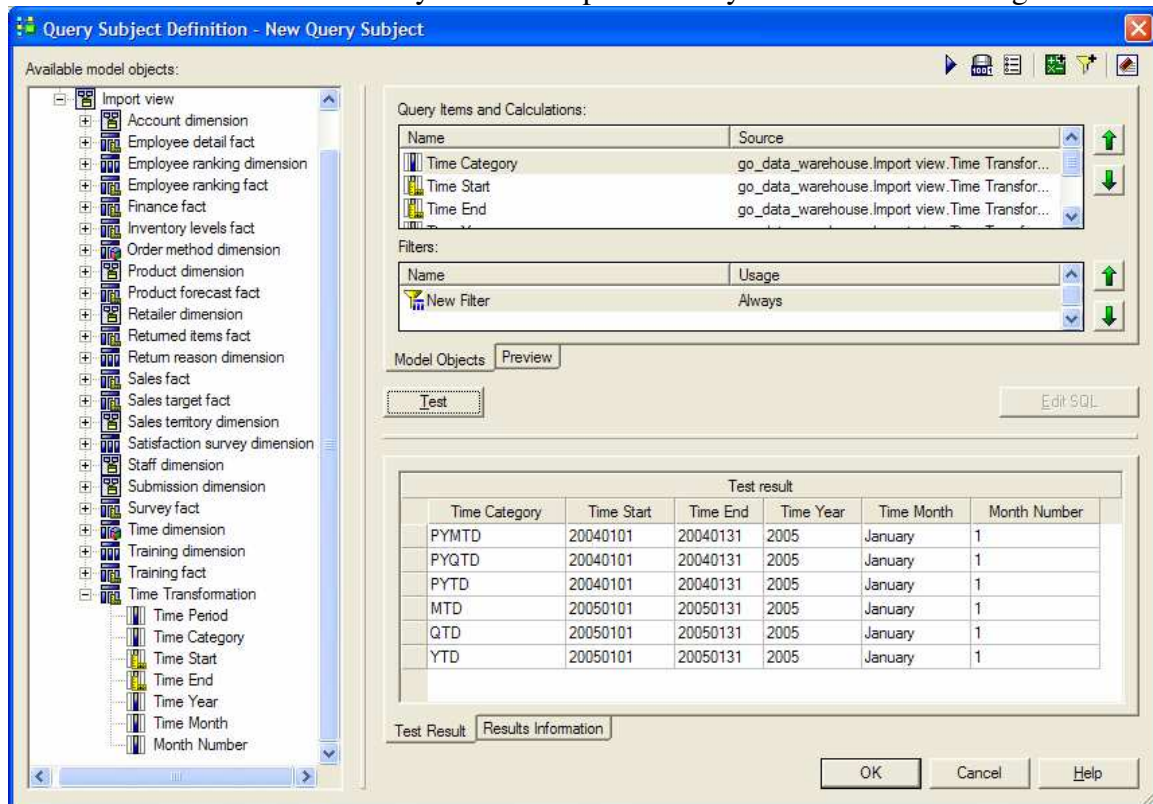


Figure 1

The alternate and more flexible layout in figure 2 allows for reporting time categories against any time period. The report authors will likely include prompting or filtering mechanisms in order to achieve the correct aggregated results. This is the layout presented and used throughout this technique.

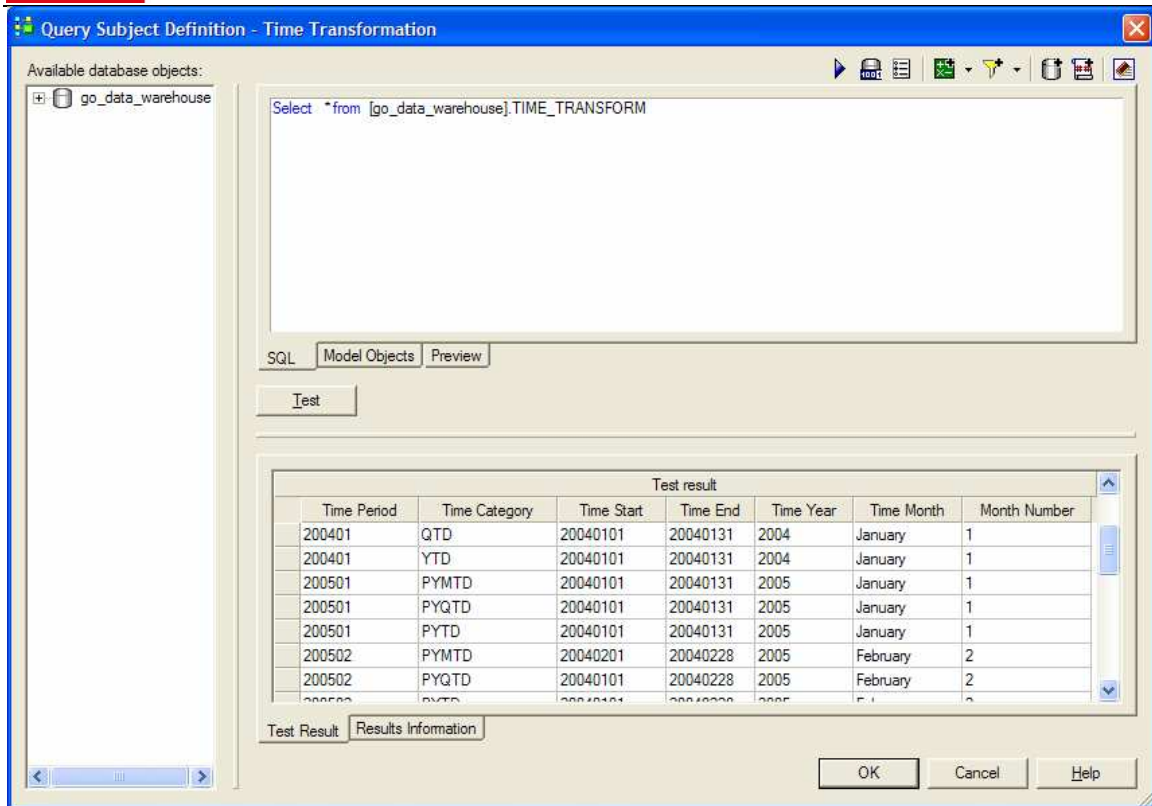


Figure 2

## Join Strategy

A compound join is necessary to utilize this technique. Better performance is usually achieved when this compound join is applied to an existing time dimension rather than directly to the fact table. This design would also simplify the model changes necessary to implement this technique in a multi-fact environment. The join will involve both start and end time columns indicated in my transformation table layout and looks like figure 3. Note that it is necessary to edit the expression itself to accomplish the correct join comparisons between the two date fields.

Relationship Definition - Time Transformation <--> Time dimension

Relationship Expression | Relationship SQL

Name:  
Time Transformation <--> Time dimension

Query subject: Time Transformation

Query subject: Time dimension

New Link

Time Period  
Time Category  
Time Start  
Time End  
Time Year  
Time Month  
Month Number

Current year  
Quarter key  
Current quarter  
Month key  
Current month  
Days in the month  
Day key  
Day of the year  
Day of the month  
Day of the week  
Week of the year  
Week of the quarter

Cardinality: 1..1 Operator: >= Cardinality: 1..n

Relationship impact:  
Each Time dimension has one and only one Time Transformation.  
Each Time Transformation has one or more Time dimension.

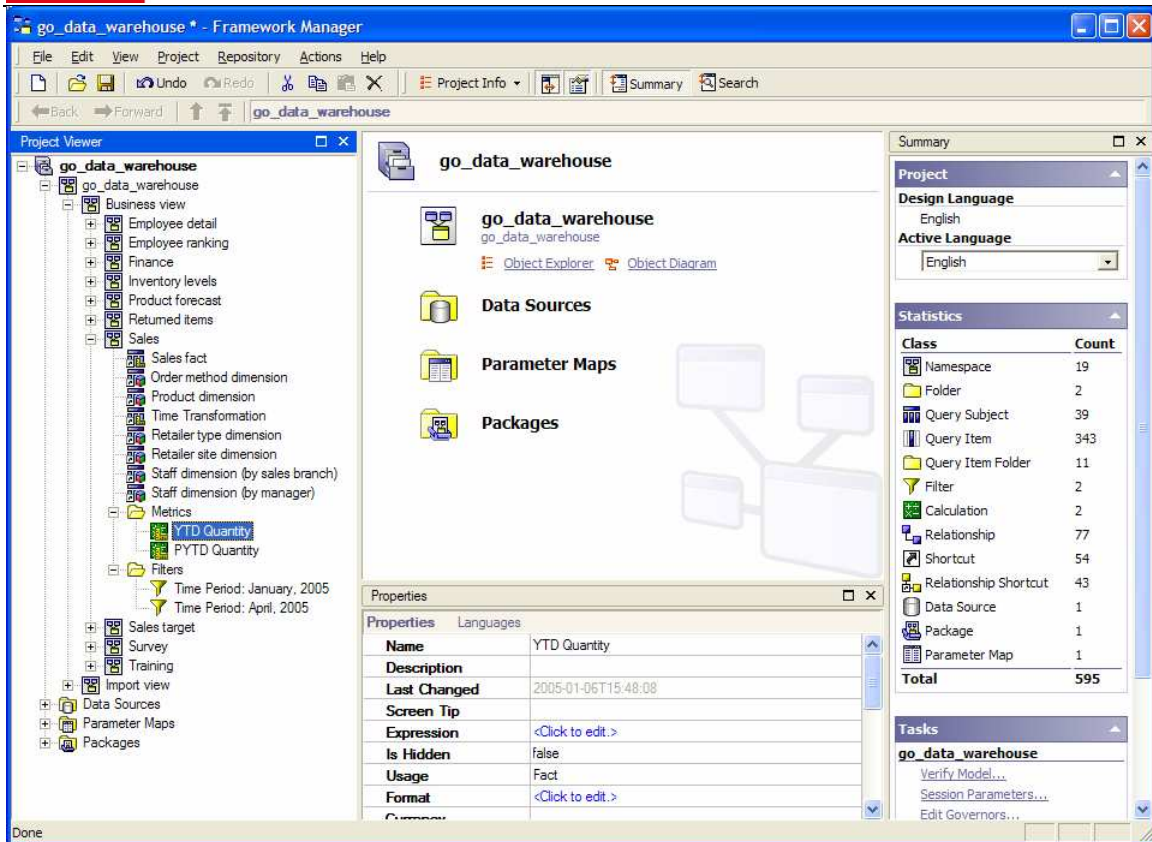
Expression:  
Time Transformation.Time Start <= Time dimension.Day key AND Time Transformation.Time End >= Time dimension.Day key

OK Cancel Help

Figure 3

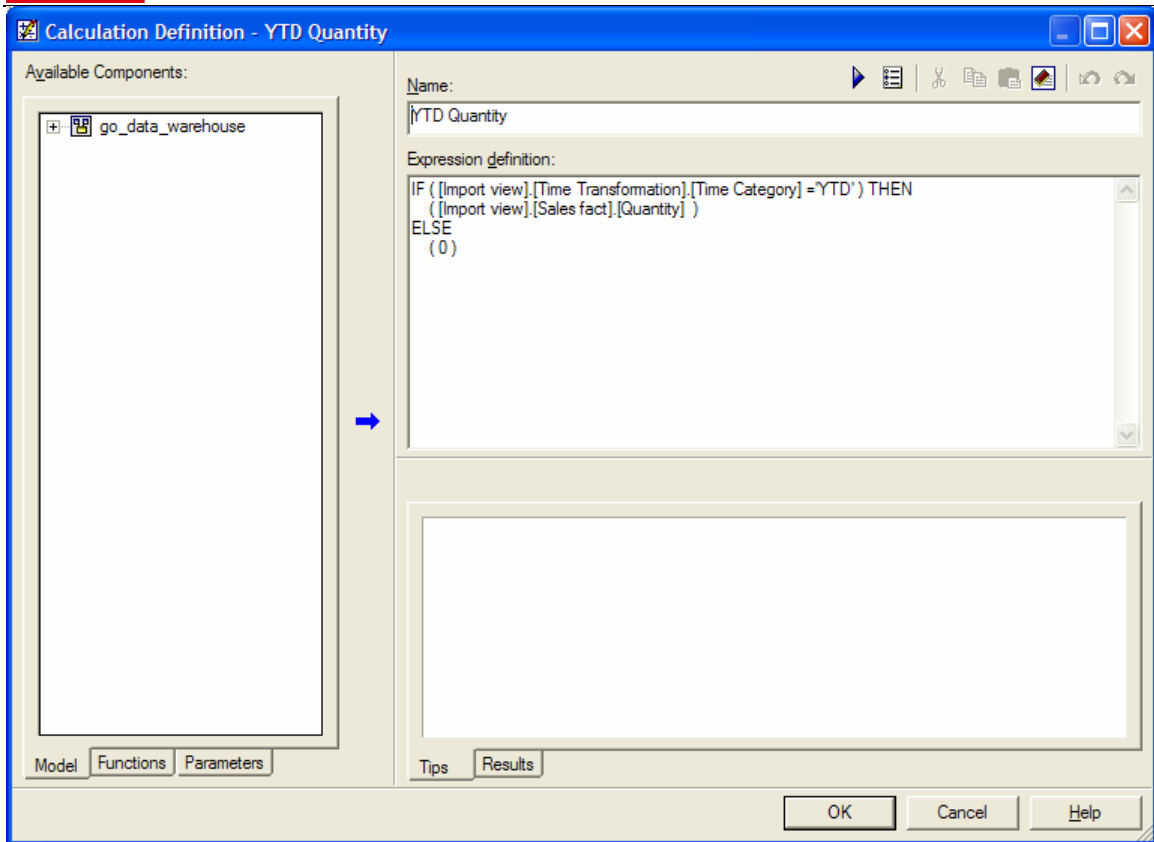
## Presentation

For many reporting needs the transformation table will likely replace the need for any original time dimension. It is particularly important to filter against the new time transformation rather than a time dimension for time period analysis. For this reason it may be necessary to replace any time dimension query subject with the transformation table as has been done in figure 4.



**Figure 4**

Calculations and filters should be added to the presentation layer as well to aid authors in report design (see figures 5 and 6).



**Figure 5**



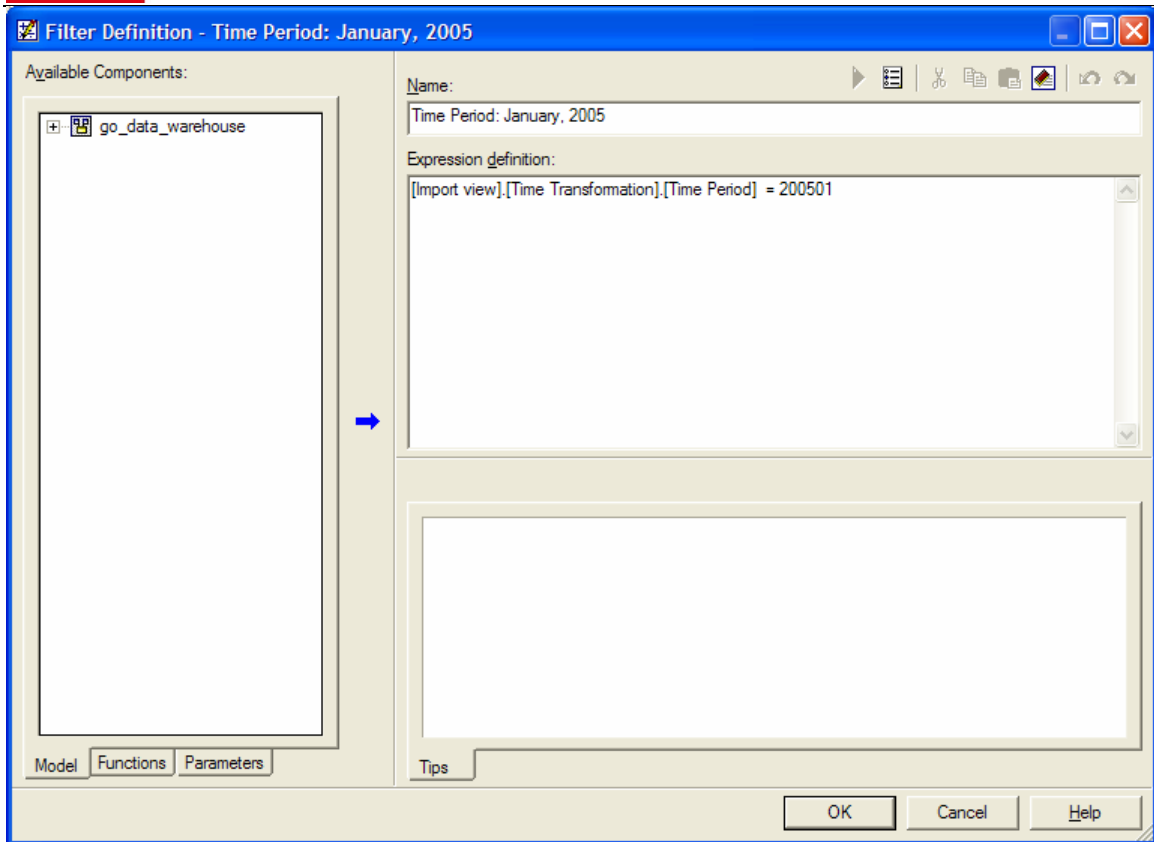


Figure 6

### ***Reporting on Time Period Analysis***

Once all of the database and modeling changes have been implemented it becomes quite easy to perform time period analysis. An author could create a simple crosstab between product lines and time categories filtered using a provided model filter with just a few clicks and have a report which looks like figure 7.

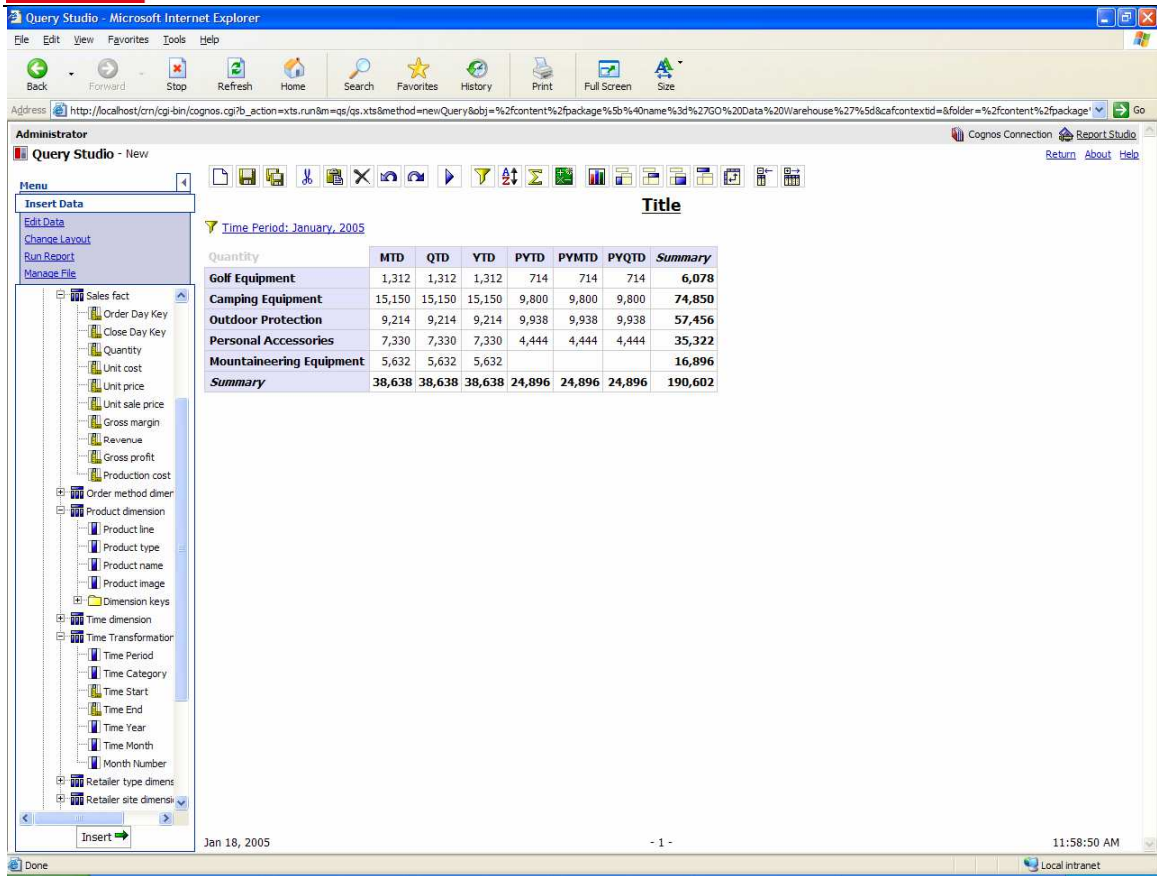


Figure 7

A Report Studio author could create reports like the one in figure 8 comparing product line sales by month for the current year-to-date versus prior year-to-date by making use of the modeled calculations just as easily.

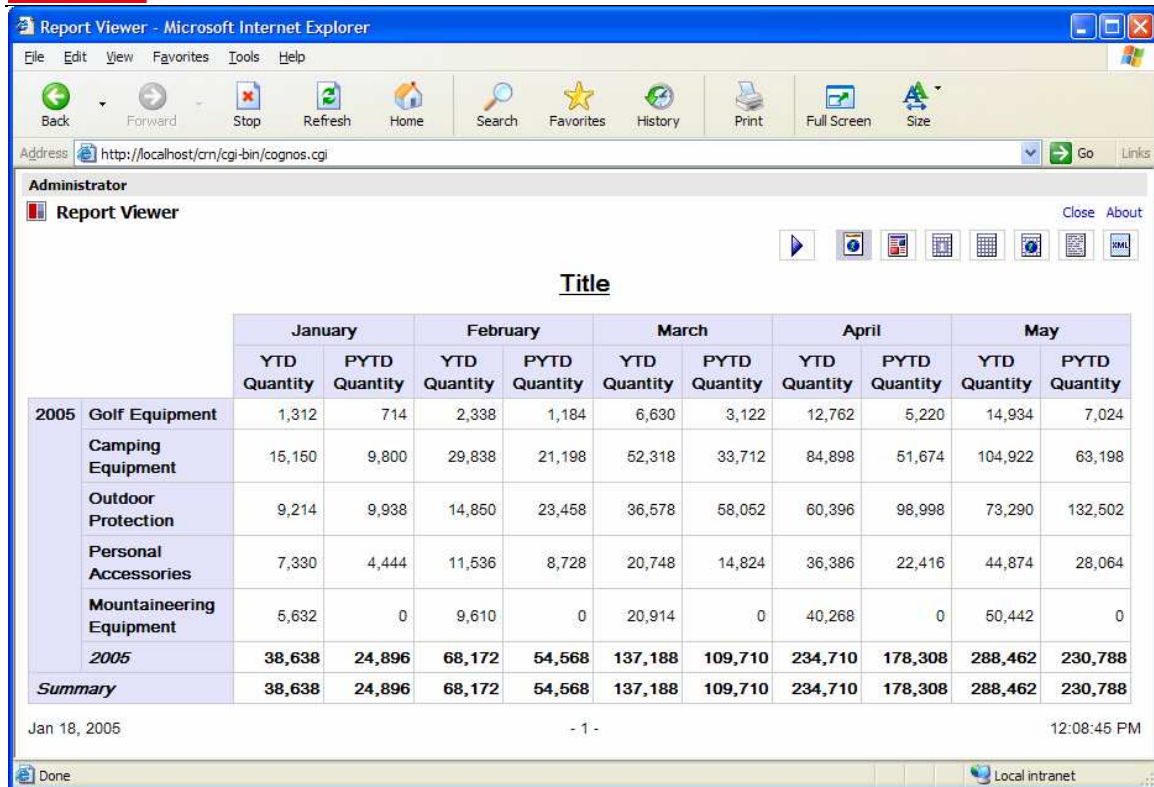


Figure 8

## Conclusion

This technique provides a database and query tool independent approach to time period analysis that should be flexible enough for any need. I haven't gone into great detail about the various ways this technique could be applied. That is up to your imagination.