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# Advanced CRM solution Using Java Applications

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## ABSTRACT

This paper presents a Java Applet developed using the Sas System and AppDev Studio Software. This Applet is aimed at bringing all the information available on a single customer to people in charge of dealing with customers in the enterprise.
The first part of the paper demonstrates briefly the need for such a tool in a Customer Relationship Management perspective. The second part presents the main features of the Applet and demonstrates the use of graphic objects to organize the information on the customer.
The third part of the paper explains that the making of all those features was made possible with the help of the technology that the SAS Institute provides and presents the reader with the advantages of using this technology.
SAS Products:
SAS/Base
SAS/Stat
SAS/ETS
SAS/Appdev Studio
SAS/Intrnet
Operating Systems: Any
Skill Level: All audiences

## INTRODUCTION

A huge amount of information about the customer contacts with the enterprise exists in the organization.
The information on the customer is located in a wide range of systems across the Enterprise (call centers, CRM systems, ERP, etc…).
Those organizations are interested in using this information in order to understand their customer, to analyze his past behavior, and to make relevant business decisions concerning the customer.
We have developed in our company a system named GSTAT/TSA that can answer this need. The system concentrates all the information available on the customers in a graphic rich user interface and helps using the analytical information in an intuitive way.
A whole range of users in different industries needs such a tool in order to understand their customer's current situation and analyze his behavior in the past. In this perspective the "customer" is viewed in a large sense and includes all the organizations in contact with the enterprise, such as suppliers, intermediaries, or insurance agencies.

We will review the main features of the system and discuss the advantages of using the Java Technology in connection to the SAS System.

## GSTAT/TSA MAIN FEATURES

### GRAPHIC FEATURES

The first and most important feature of our system is that it unites all the data available on a single customer and presents it in an intuitive way to the people in the organization in need to know the customer. This was our main question throughout the development of the system: what can we do in order to provide a clear picture of who is my customer? First of all, being a company

that is specialized in data mining and statistical modeling, we know the tremendous importance of presenting time series data in order to understand the current customer situation.

For us the problem was how to combine in a single interface the customer present situation along with providing the user with the ability to analyze his customer past behavior. The solution was to add in every screen of the system graphic features the possibility for the user to see "snapshots" of the customer situation for each month in the data for administrative data or to see a graph showing time numeric data for each month in the data. As you can see in figure 1 the combo box at the top of the screen allows the user to see the same customer at different periods in the past. Figure 2 shows the same screen with the "see history" option checked.
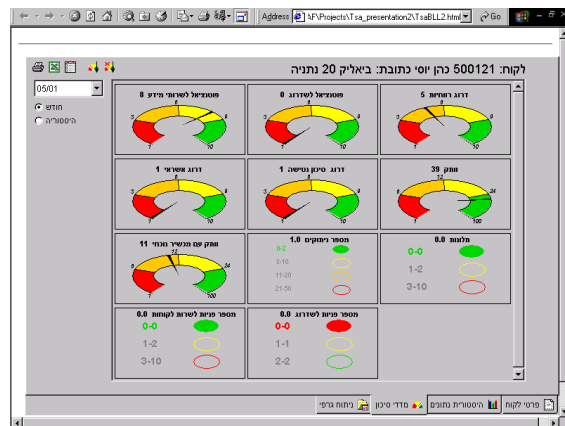


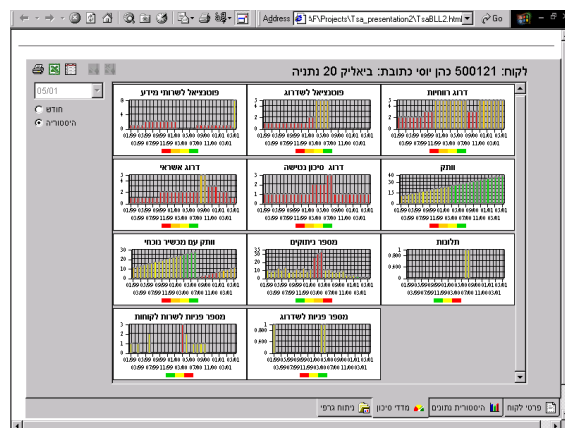**Figure 1. Snapshot of the customer**



**Figure 2. Historical view of Screen shown in Figure 1.**

The second most important feature is the ability of the system to present the user with a rich set of graphics objects, each one customized to suit the characteristics of each piece of information available on the customer. For example we use color ranges in order to allow the user to compare the customer situation to the entire population average. In other cases when the user needs to compare multiple pieces of information on the customer, we give him the possibility to see the comparison graphically and through time.

The problem with too much information is that it can be harmful if it is not organized in a coherent fashion. We have introduced in the system a whole range of features in order to make the information available to the user in an intuitive way. Such features are implemented throughout the system. Graphic trees are used to organize the data (more than two hundreds variables!) under sub-categories that make sense to the user (see Figure 3). Radio Boxes allow the user to choose to see multiple graphs ordered by category in the same screen. Graphics objects are ordered according to the value of the underlying variables in terms of importance to the user. Multiple graphs are bundled together in the same screen in order to compare data.
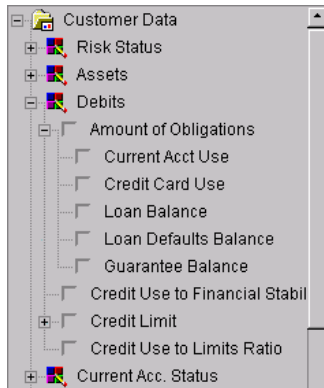


**Figure 3. Use of Graphic Trees to Organize the Information**

A lot of thinking was given to utilize the objects and the interactivity provided by the technology in order to give the user the possibility to customize the information according to its needs and analyze the customer with a minimum amount of time and efforts.
The results: Every single graph can be zoomed to let the user concentrates on a single variable and analyze it in-depth. Every graph can be seen in different types (line graph, bar charts, pies, etc…). The user can choose to see the data composing the chart in a table under the chart.
Because of the nature of historical data and the very large number of past months of data available on a single customer, we allow the user to aggregate historical data to different frequencies in simple and easy to analyze line and bar charts.

**ANALYTICAL FEATURES**

The connection to the SAS System gave us the possibility to add complex analytical features to our system. Without the SAS System, those features would have been almost impossible to develop.
One example of those features is the user interface shown below (see figure 4.) that shows the possibility to calculate complex statistical models online by executing forecast of series. The user interface allows the user to enter the parameters needed by the procedure.
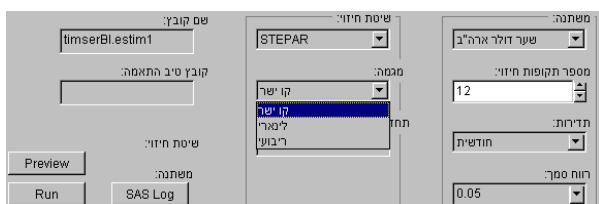


**Figure 4. Parameter Entry Interface for Forecast Procedure.**

The SAS System installed on the server executes the statistical procedure (FORECAST procedure in SAS/ETS Software) needed to make the forecast and send back the results to the client in the form of a SAS Data Set. The final result is a graphic representation of the forecast in the applet (see figure 5.).
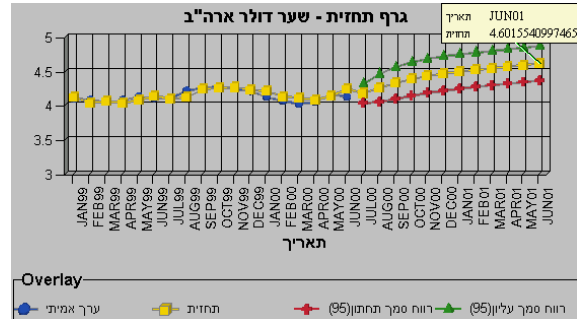


**Figure 5. Graphic Representation of the Forecast**

**EASY CUSTOMIZATION OF THE SYSTEM**

The system is fully customizable to different industries and to different types of users within the organization. Simple SAS tables (see Fig 6) define every field in the system. We can define which variables will be in each screen along with the category those variables belong to. For each numeric variable we can attach diverse properties such as ranges, colors, aggregation types (summarization, average, last period, etc…) and more.



**Figure 6. SAS Table that customizes the System.**

**CONCLUSION**

The JAVA/JSP development environment AppDev Studio Software from SAS Institute was for us a tremendous help in developing the system. It has opened before us the possibility to use the advanced analytical capabilities of the SAS system along with a fully interactive system entirely written in JAVA.

**CONTACT INFORMATION**

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