

Paper 362-2009

Deployment of SAS EBI Client components in the Research Area of the Bank of Italy: first experiences

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Introduction

Data Management and statistical analysis today need every competitive advantage they can get, and Information Technology (IT) management is being asked to deliver solutions that give a competitive advantage to the business process by reducing total costs while keeping the highest quality standard.

One of the main tasks of a research unit in a central bank is that of collecting reliable statistics, analyzing and forecasting the whole economic conditions.

Actual implementation of these tasks is carried out by using an ample set of information tools. Among these, here we have taken into account the production of short term analysis reports. The improvement in the timeliness in production and delivery of these reports alleviate the burden from routine tasks allowing to devote more focus on the economic analysis.

Here we present some attempts to further streamline the production of some short term analysis by using some of the tools present in the SAS Business Intelligence product suite.

Software framework

The Bank of Italy Research Area is composed by a team of about 430 users. Data processing services are provided by a three-layer computing platforms organization. Each layer mirrors an growing level of centralization: individual, departmental and company. In this paper we will focus our interest on the individual computing unit. One of the main challenging task for I.T. support is the management and control of the software kit deployed on each one of the users' P.C. based on the Windows operating system. The availability and the correct workings of many company-wide applications hinges upon the stability and easiness of deployment.

The task of installing software components whose interest is limited to the Research Area can be addressed with essentially two solutions:

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- a) A centralized software distribution center (e.g. SMS) broadcasting its software to a given list of P.C.
- b) A departmental software repository where the authorized user download the code at his convenience.

The former paradigm corresponds to a *push* technique whereas the latter is more a *pull* way of working.

After the comparison of the two methodologies we have opted for the second one because it increases end users flexibility keeping down the complexity of the whole process reducing the I.T. skill required resources.

Technical solution and user categories

The departmental level of the three-layer computing organizations is based on an high end UNIX based cluster of two SMP (Symmetric Multiprocessor) nodes of 8 CPUs RISC6000 machines. Employment of the open source LAN manager SAMBA offers a natural disk sharing platform. This remote disk space allows the concurrent access to multiple users and provides a simple way for arranging a software repository for storing end-user packages.

All the SAS Enterprise Business Intelligence (EBI) clients components and the whole set of its windows requirements have been copied onto this SAMBA driven software repository.

Analysis of the different users needs has lead us to the definition of two users categories:

- 1) Standard users
- 2) EBI developers

For both of these two categories it has been established a common set of software requirement comprising the following components:

- a) SAS Java runtime environment 1.4.1
- b) SAS Java runtime environment 1.4.2
- c) Visual C++ runtime distribution environment
- d) Microsoft .NET framework 1.1
- e) Microsoft MDAC

Among these software requirements, here we provide a short description only for the last two elements in the list because the others are already used by different applications.

The Microsoft .NET Framework is a software framework that is available with several Microsoft Windows operating systems. It includes a large library of pre-coded solutions to common programming

problems and a virtual machine that manages the execution of programs written specifically for the framework. The .NET Framework is a key Microsoft offering and is intended to be used by most new applications created for the Windows platform.

The pre-coded solutions that form the framework's Base Class Library cover a large range of programming needs in a number of areas, including user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. The class library is used by programmers, who combine it with their own code to produce applications.

Programs written for the .NET Framework execute in a software environment that manages the program's runtime requirements. Also part of the .NET Framework, this runtime environment is known as the Common Language Runtime (CLR). The CLR provides the appearance of an application virtual machine so that programmers need not consider the capabilities of the specific CPU that will execute the program. The CLR also provides other important services such as security, memory management, and exception handling. The class library and the CLR together compose the .NET Framework.

Microsoft Data Access Components (MDAC) is a suite of data access APIs that ship with the Windows operating system. In many cases, an older operating system can be retrofitted with a newer version of MDAC by running the redistributable installer package. MDAC includes three major API surfaces—ODBC, OLEDB, and ADO—each of which has been optimized for a different set of applications. All three major components of MDAC employ the provider model, which allows access to a variety of data sources using a virtually identical set of programmatic calls. Vendors of data sources not supported out-of-the-box, and interested third-parties, can enable access to additional data sources using the same familiar set of MDAC interfaces by supplying a provider for that data source.

The whole set of software components has to be installed by the two category of users.

The standard users will install the following packages:

- a) SAS Enterprise Guide
- b) SAS EBI Microsoft Office Add-ins

The EBI developers besides the previous packages will install the following components.

- a) SAS management console
- b) SAS foundation services
- c) SAS Information Map Studio
- d) SAS OLAP cube Studio

According to their profile, the users are authorized to download only the software component suited to their needs.

The final step of the SAS EBI client components consists in the registration of the SAS Add-ins for Microsoft office into the windows registry.

The whole installation process can be summarized in the following three steps:

- 1) Installation of the software requirements

- 2) Installation of the required SAS EBI components
- 3) Registration of the SAS Office add-ins into the windows registry

The execution of these steps requires the administrative authority on the local machine and it took about one hour to complete the whole process on a 3 GHz Pentium dual-core with 2GByte of real memory.

First experiences with SAS EBI tools

In this section we present some attempts to streamline the production of some short term analysis by using some of the tools present in the SAS Business Intelligence product suite.

The production and diffusion of report on the short term behavior of the economy is one of the main task for a Research department of a Central Bank.

These reports are drawn by assembling tables, graphs and some lines of text. The current production cycle is composed by the following steps:

- 1) Data collection from a Relational DBMS and other personal database;
- 2) Time series processing with the production of the series to be displayed;
- 3) Production of an ASCII file with all the time series
- 4) Export of the ASCII file on the User PC
- 5) Production of tables and graphs in MS Excel
- 6) Import of the MS Excel tables and graphs into a MS Word document for building a single scalable document:
- 7) Production of a PDF file and broadcast to the final users through the mail channel.

At this first stage we have taken into account only the steps from point 4 on.

We have reduced the final 4 steps of the previous list into a EG project arranged in the following tasks:

- 1) Transformation of the ASCII files into a SAS datafile (fig. 1)
- 2) Design of the table, production of the four graphs and report production (fig. 2)

The PDF format transformation of the final SAS report has been carried out by printing the report from within the SAS Web Report Studio. The lack of a PDF transformation tool in Enterprise Guide will be eventually removed with the next release of the SAS EBI bundle.

The final report produced within Web Report Studio is shown in figure n. 3.

Figure 1

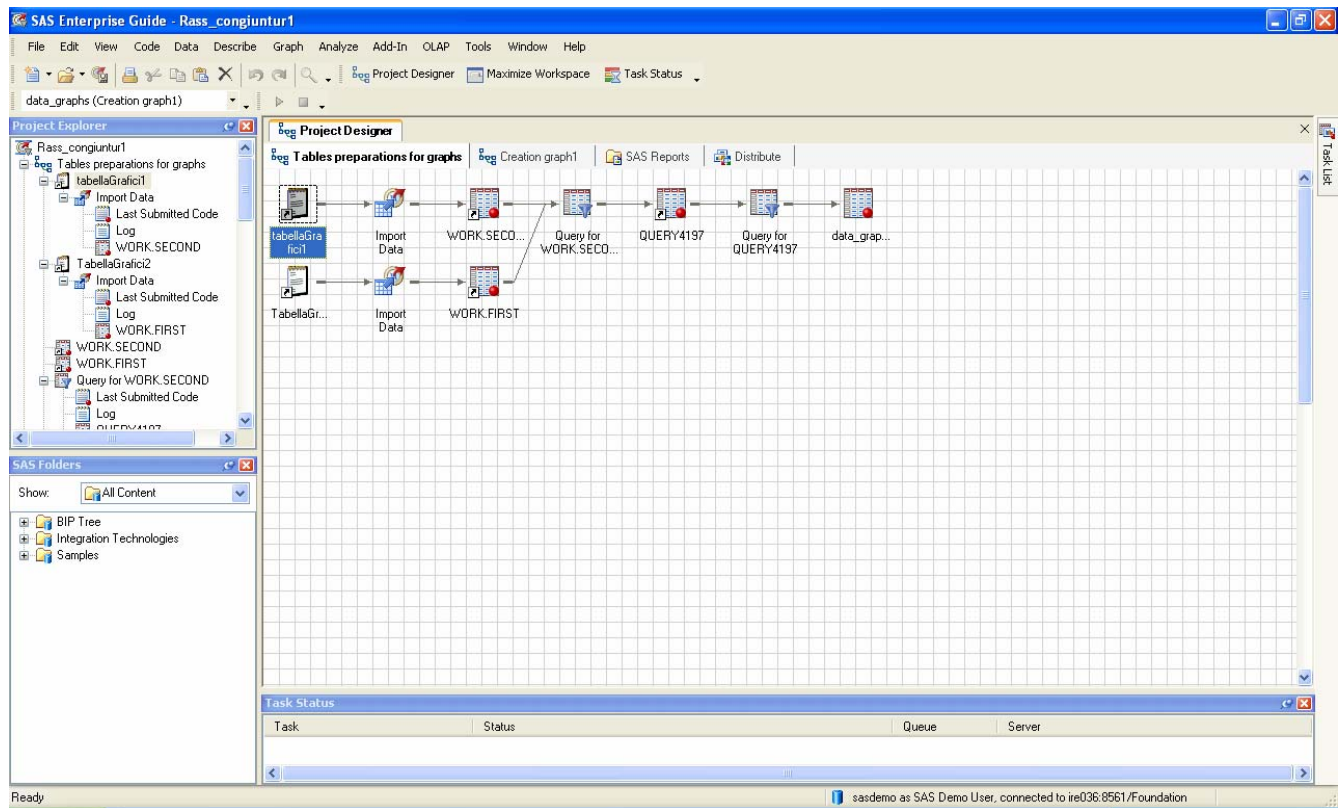


Figure 2

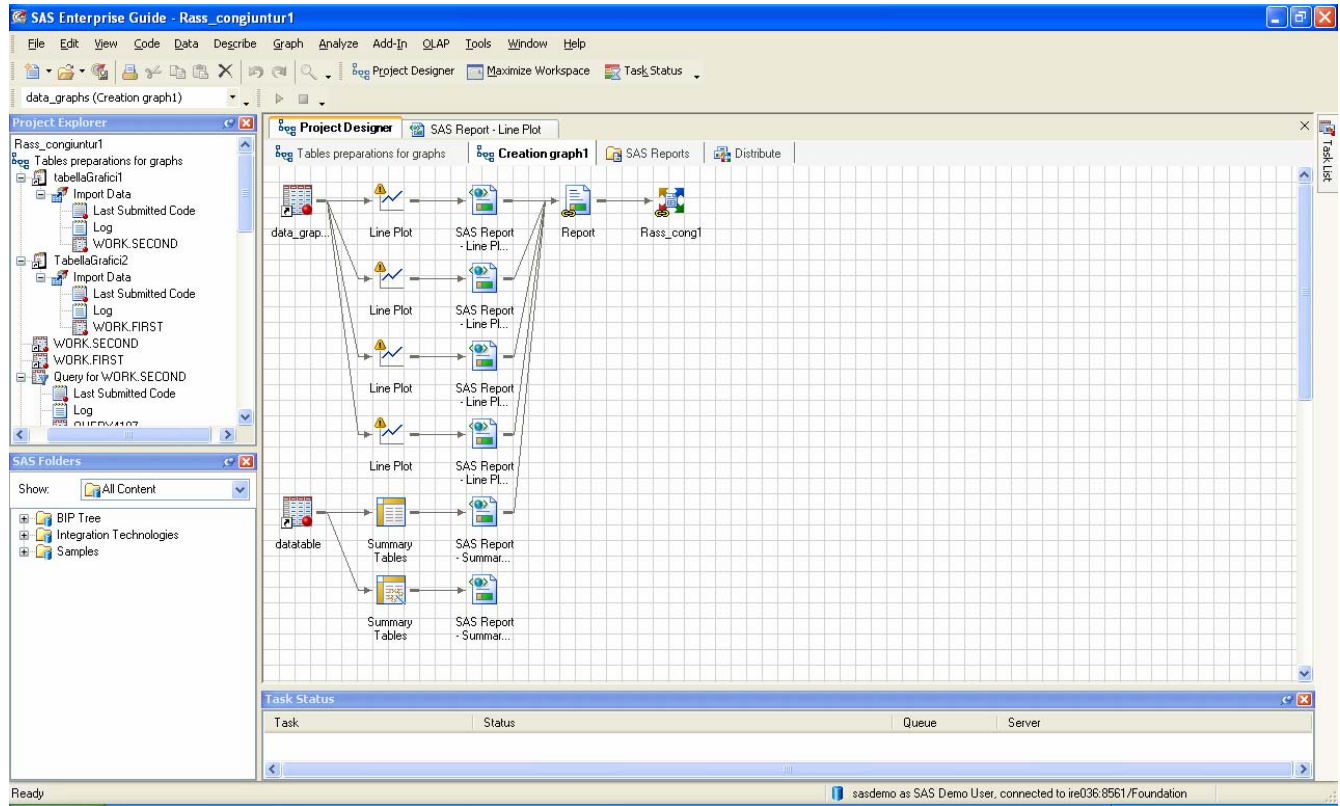


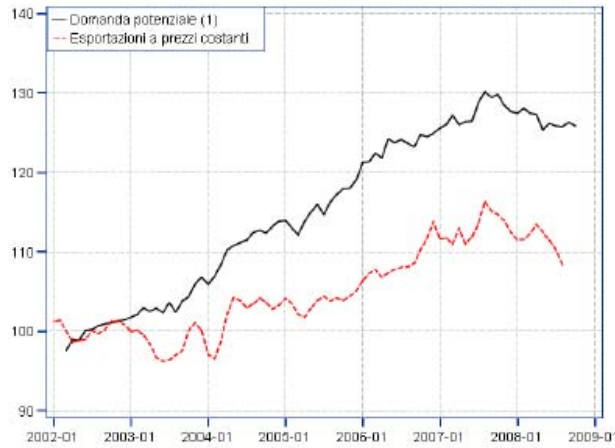
Figure 3

PERIODO			Valori grezzi						Valori destagionalizzati											
			Variazioni									Variazioni								
			esportazioni			importazioni			esportazioni			importazioni								
anno	trimestre	mese	Intra-UE	Extra-UE	Totale	Intra-UE	Extra-UE	Totale	Intra-UE	Extra-UE	Totale	Intra-UE	Extra-UE	Totale						
Valori a prezzi correnti	2008	2° trim.	6.90	5.40	6.30	1.80	13.90	6.70	3.40	-4.40	0.20	1.60	1.60	1.60						
Valori a prezzi costanti	2008	2° trim.	2.10	-0.50	1.00	0.60	-3.40	-1.80	0.70	-2.50	-0.70	2.00	0.10	1.30						

Fonte: elaborazioni su dati Istat.

1. Italia: domanda nei principali mercati di sblocco e esportazioni a prezzi costanti

(indici 2002=100)



Fonte: elaborazioni su dati Istat e Uffici di Statistica nazionali.

2. Indicatori di competitività (1)

(indici 2002=100)



Fonte: BCE, elaborazioni su dati FMI, OCSE e Eurostat.

3. Italia: fatturato estero e esportazioni a prezzi correnti

(indici 2002=100)



Fonte: elaborazioni su dati Istat

4. Italia: giudizi sugli ordini e esportazioni a prezzi costanti

(indici 2002=100)



Fonte: elaborazioni su dati ISAE e Istat.

Concluding remarks

The computing architecture of large institutions is mostly a multi-tier structure. The lowest level in this structure is the PC. This machine usually hosts the windows operating system.

A quick and error free deployment process is of paramount importance in providing sound client-server applications. Taking advantage of a network disk share we leave the user the task to install the software packages suitable for her/his profile.

Short term economic analysis provides a relevant tool in policy decisions in central banks and economic agency.

A first experience on the SAS EBI components has been carried out by streamlining some steps of the process for production and broadcast of some short term analysis report. The first preliminary results seem quite satisfactory in reducing the need of moving among the different office packages speeding up the broadcasting process to final users.