VI UCM Modelling Week 2012

Project: A model to predict the clients' phone calls to the Iberdrola call center

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I. Introduction

Call center is a primordial communication tool between the customers and a company. For instance, it allows to collect new clients or to receive their inquiries and questions. A good quality of this service is essential to ensure the customers´ satisfaction. To do so, a basic requirement is to have, at each time, a sufficient number of operators in order to avoid large waiting time.

However, keeping a high number of operators at each moment is relatively expensive for the company and not necessarily efficient. A dynamic distribution is much more adequate. To this aim, predicting in a 'close future' the number of phone calls that the center will receive is fundamental. The Mathematics, in particular Statistics and Dynamical Systems, offer good tools to evaluate such a number.

II. Objectives

During this work, we are interested in developing mathematical models to predict the behavior of the clients' phone calls to the Iberdrola call center. To this purpose, we will use an historical database based on 8 years daily information and we will focus on 8 particular explanatory variables (see Figure 1).
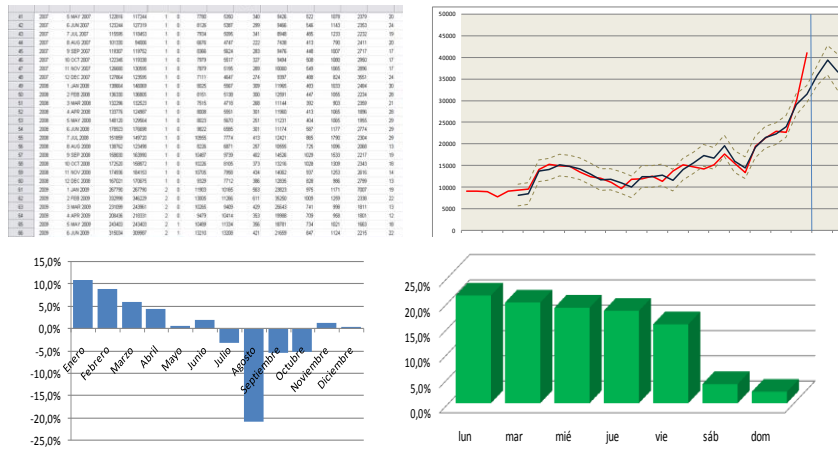
Fig. 1 Example of available data: Excel© tables, daily and weekly histograms and graphs, etc.

The objective of those models will be to predict the number of 'future' phone calls (next 5 weeks) considering data from previous 6 weeks. Furthermore, we will perform a sensitivity analysis of the model in order to avoid an overestimation of the results.

III. Scheme of the Project

- **Analysis of the date:** Selection and treatment of the explicative variables, analysis of the periodicity of the data, interpretation of the data behavior, etc.

- **Development of the models:** considering regression techniques, ODEs, software (SAS, SPSS or MATLAB).

- **Validation of the model:** the data base will be split in two sets: one for the model calibration and other one for the model validation. Analysis of the variations between simulated and real number of phone calls.

- **Sensitivity analysis of the model:** with respect to the model variables. Correction of the model.

- **Prediction of 'future' phone call numbers**: regarding the complete database and when real data are not yet available.