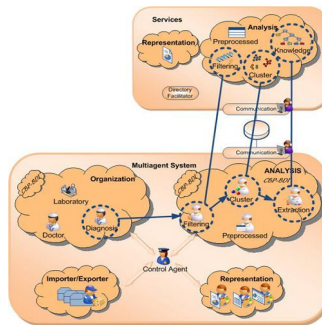


## Intelligent Biomedic Organizations (IBOs), a New Smart System to Support Medical Staff



### IBO architecture

A researcher at the [Universidad Politécnica de Madrid](#) is participating in a research on bioinformatics. The research has given as a result a model, Intelligent Biomedic Organizations (IBOs), that provides data analysis from the genetic expression.

The study, carried out in collaboration with the Universidad de Salamanca and the Cancer Centro of Salamanca (Centro de Cáncer de Salamanca), has proposed an organizational model specially designed to provide medical staff with support for their daily tasks during data analysis as well as establishing a innovative intelligent system for classification and pattern prediction from large volumes of data. The results obtained have shown improvements compared to previous analysis performed manually.

The application of Information and communications technology in the field of biomedicine has become increasingly important over the last years. Frequently, the data analysis on bioinformatics requires conducting different sequences of actions grouped in pre-processing stages information filtering, clustering and knowledge extraction or classification.

The actions to perform for each stage are diverse and it required to establish actions and the sequence of its application in the data analysis process. This study shows an architecture that allows us to analyze workflows for data analyzing. Depending on the results on data streams, the system can create new flows that optimize the results.

The core of the system is involved in reasoning strategies based on cases for the reorganization and automatic planning according to analysis carried out previously. Basically, the system attempts to simulate the human behavior, to seek for similar troubles on a memory of cases and retrieve the most similar troubles with the actions implemented.

The sequences of retrieved actions and the results can create a new sequence of actions to be applied to the new problem. After that, the solution is assessed and stored the result obtained to take into account for future assessment.

The system incorporates techniques of data mining, statistics and artificial intelligence which are applied as actions to workflows. The organizational model can be applied to diverse types of data that require certain computational load.

The proposal was proved on bioinformatics for the classification of patients by genetic analysis, particularly on patients affected by different types of leukemia and data from brain tumors.

The system attempts to simulate medical staff behavior of laboratories conducting the pre-processing states, information filtering, and joining and classifying in a way that the model can select the techniques to be applied to the stages and the generated sequence as well as workflows analyzing automatically and enhancing the results obtained previously in analysis performed manually.

Source: [AlphaGalileo](#)

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