

## Intelligent business: Data analytics application in companies



### TYPE OF RESULT

New technology  
New product  
[ **New service** ]  
New knowledge or skill



### COMMERCIAL MATURITY LEVEL

Conceptual idea  
Proof of concept (design)  
Validated in a controlled  
environment  
Validated in a real environment  
[ **Successfully implanted** ]



### PROTECTION LEVEL

[ **Non- applicable** ]  
Patent  
Software  
Know - how  
Utility model

### Technology description

Data analytics in companies is vital for making easier the appropriate daily decision making, obtaining, thus, better results. In this sense, extraction and analysis of variables that are relevant for classifying or predicting any kind of challenges that company may face (demands, incomes, cancellations, etc.) is crucial. For this reason, a series of algorithms classified as artificial intelligence are used; among them we can find the following:

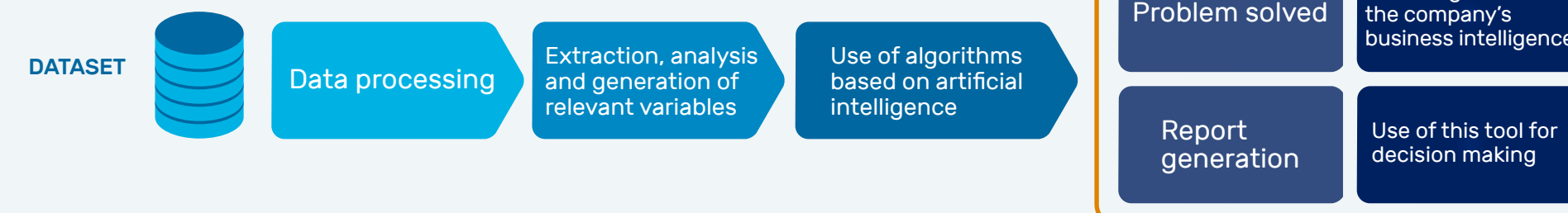
- Decision trees.
- Statistical models.
- Bayesian networks.
- Deep learning: convolutional, recurrent or deep neuronal networks, among others.
- Support vector machines.
- K-nearest neighbours.
- K-means.

This type of algorithms, through their mathematical structure, can understand complex patterns and determine which variables are the most relevant ones in order to predict particular situations.

Therefore, this is a technical support service especially made for each company or organisation, consisting in application of data analytics and artificial intelligence, in order to obtain relevant information that contributes to improve management and generate positive performance. This type of solutions will become a part of the set of assets conforming the company's business intelligence for better decision making.

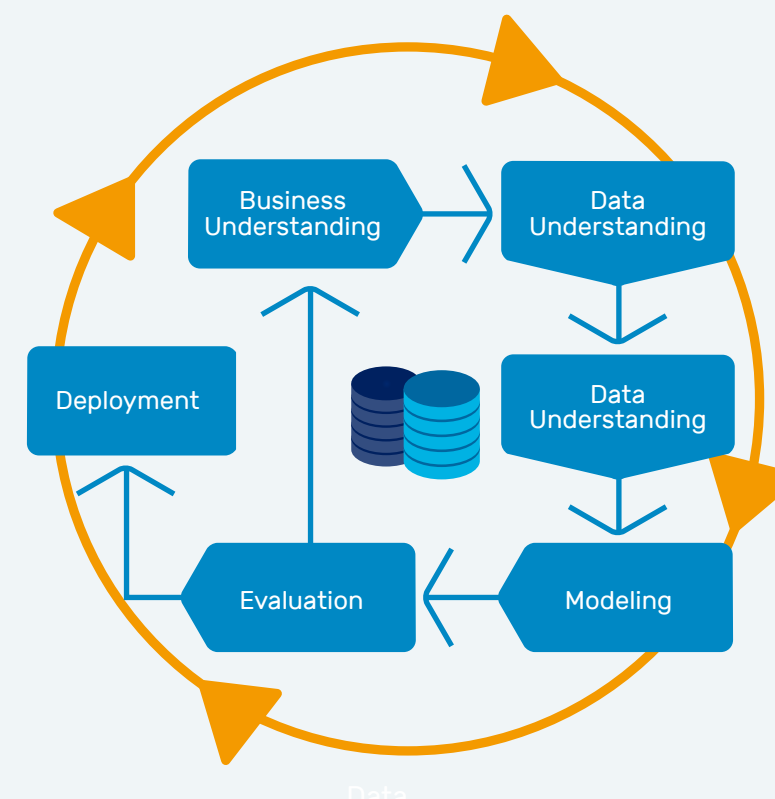
For example, hotels may be interested in tourist behaviour analysis in order to foresee possible cancellations and, this way properly deal with the hotel reservations. The technical support service is structured in the following stages:

- Obtaining the dataset to be used.
- Pre-processing data. Data cleansing tasks.
- Extraction and analysis of pre-processed data and generation of relevant variables in



order to adequately solve the difficulties.

- Use of algorithm based on artificial intelligence for predictions generation.
- Production of reports with the obtained results, which will include recommendations about the ways for integrating this tool in the company's whole business intelligence for decision making.



In order to carry out this service, Cross-industry standard process for data mining (CRISP-DM) is applied, which is a standard for developing projects based on data mining and artificial intelligence. This service stands out for taking into account client's considerations and necessities during the whole technical support service.

Although in most cases the volume of required data is not massive, it is necessary indeed to ensure data quality in order to get value results for the organisation.

The development of software tools to be used in the technical support will be done using programming languages such as Python and R.

### Fields of application

This service is targeted at any kind of company or organisation and any business sector, although many of the projects on which we have previously worked on have been oriented towards tourism sector and SMEs.

Also, public administrations may find this service very useful since it would allow to foresee critical situations such as non-payment difficulties, fraud or possible losses arising from closure of companies, among others.

### Market opportunity / needs

In an increasingly digitised economy, data analysis has become into a vital element for competitiveness. Most companies use business intelligence applications within their business processes in order to take advantage of the data that they generate, learn more about the difficulties of their companies and make appropriate decisions for facing such difficulties optimally. However, not all of them make the most of the value of the generated data.

In this sense, implementing solutions based on data analytics and artificial intelligence is becoming more necessary in order to create more information flows that allow to foresee future risks, as well as to detect possible opportunities for improvement in different areas such as better knowing the preferences of their clients for redirecting management of the offered services, as well as customise their experiences in their relationship with the company or as a way to foresee behaviours, demands, non-payment difficulties, cancellations, etc

### Competitive advantage and innovative aspects

The technological and business view of the research group (some of the members of this research group have a double degree on Computer Engineering and Business Administration) provide a high capacity and expertise for working on complex projects using both a business point of view and data analytics and artificial intelligence tools, which allows a quick problem analysis as well as to provide solutions customised to the needs of each company.

### Resources needed to be implemented

Since this is a custom service for each organisation, its implementation in environment would depend on designing a project. In any case, quality data are necessary for solving the difficulties to work in.

### Application references

This service has been successfully tested in several hotel chains located in Canary Islands.

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