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The advent of the data economy - defined as the value and the impact derived from the collection, storage, analysis, and utilization of data - has made indispensable in business:

- the knowledge of Statistics;
- the presence of the data scientist figure in the company to manage data and help make decisions based on empirical data;
- the need for easy access to available data;
- the need to implement a proper data strategy to maximize data value.

In this thesis, we will pitch out these four aspects that are fundamental in modern businesses.

The first aspect is about the growing importance of Statistics in business, which has two purposes: synthesizing and generalizing.

Synthesizing means preparing the data collected in form (tables, graphs, numerical summaries) that enables a better understanding of the phenomena for which the survey was carried out. Synthesis meets the need for simplification, which stems from the human mind's limited capacity to handle articulated, complex, or multidimensional information. Descriptive Statistics is a specific field of Statistics that describe how to use techniques that allow a comprehensive study of a large amount of quantitative and qualitative information to highlight its characteristics, links, differences or associations among the variables surveyed.

Generalizing means extending the result of the analysis performed on a limited group of statistical units (sample) data to the entire community to which it belongs (universe, population). This operation of generalizing is carried out according to methods of induction, which represent the content of Inferential Statistics.

With the Inferential Statistics and Decision Theory closely related to the calculus of probability, it is possible to understand and interpret uncertain or random events and suggest rational rules of behavior and decision-making.

The contribution of Statistics is not limited only to the data analysis phase. Indeed, its real added value is expressed in the formulation of hypotheses of research, in the argumentation of theses, in the adoption of appropriate solutions and appropriate methodologies, in the choice of survey methods, in the formulation of the sample, in the procedures for extending the results to the reference universe.

Keeping these steps under control means producing reliable and cost-effective results and, in line with the definition of Business Statistics, master both techniques of Descriptive Statistics and Data and Inferential Analysis.

Statistical tools and methods thus enable us to deal rationally and effectively with various business problems.

By limiting the exposition to general purposes and thus ignoring the technical and specialist aspects of the applications of Statistics to the business environment, it must be said that this discipline is used successfully both in the analysis of production and management processes and results, and in assessment of the conditions of the market in which the company operates; in addition, the applications of Statistics for forecasting purposes, on market and sales trends, are beneficial, especially in the current economic situation; finally, the contribution of Statistics in the planning of marketing strategies is particularly significant.

Predict in the short or medium-long term how much the company will be able to sell in the future and what the market demand will be, understood as the primary demand for the asset in which the company is interested, is crucial for the entrepreneur and business manager because combining the two forecasts makes it possible to determine how much the company's market share may vary.

These kinds of forecasts involve "internal" assessments of the company's production capacity and "external" assessments of general market trends, absorption capacity, new entries or segments, or the need to strengthen the company's presence.

The role of Statistics can be fundamental to help a company to develop in several areas, for example:

- Evaluate if and to what extent customers are satisfied with the product that the company produces or with the service it offers. This is the so-called "customer satisfaction", a crucial aspect to which the company must increasingly refer because it allows it to acquire or consolidate competitive advantages on the market over time. Having a precise picture of the degree of satisfaction of one's customers means having solid tools to face the competition; knowledge of consumer preferences determines the success or failure of planned marketing strategies. The greater the customer loyalty, the lower the competitive pressure, the more solid the market position of the company and the more valuable is the stock of intangible resources ("fiduciary capital") available to the company to consolidate the position and plan new marketing strategies.
- Analyze the characteristics of one's customers or potential customers to adopt differentiated commercial strategies or evaluate the entry of new products or services. Since for each type of product or service there is a certain heterogeneity of consumers, it is necessary to apply market segmentation techniques aimed at identifying the different market demands with respect to which to adapt suitable products and sales policies.

In recent years, thanks to the increased volume of data to manage, analyze and interpret, Statistics has been joined by Information Technology, because traditional approaches to information processing

are not sufficient to manage large amounts of data (Big Data). Actually, the amount of data is not the real issue, but rather the way in which data are used: through the use of algorithms capable of processing many variables quickly and with few computational resources.

The executive research doctorate aims to train employees who, while maintaining their professional role in the company, can easily deepen the issues faced in the professional context. This work results from a close collaboration between the College of Professors of the University of Salerno and the ELIS Consortium started in the academic year 2019/2020. In particular this *executive doctoral thesis* is based on research activities carried out through the development of 3 industrial projects carried out for some large Italian companies (Ferrovie dello Stato Italiane, RAI, Cassa Depositi e Prestiti). The first goal of each project, therefore, is not the production of a scientific paper but rather the creation of a tool that could solve a scientific problem.

Among the most common problems companies face is the collection and interpretation of data.

Companies today collect huge amounts of data on customers, operations, social networks, etc. In this flourishing of data, the problem of enhancing the data itself emerges, that is, moving from data to information. Statistical Learning is the technique used to extract information from data and make predictions about possible phenomena that may occur.

Statistical learning therefore helps to make more informed decisions in an environment of uncertainty. And we know how uncertain today's world is.

Therefore, this thesis aims to provide an approach to data-aware use in business. Data, in fact, increasingly represent a corporate asset that must be enhanced in order to derive value from it: moving from data to information (Chapter 2). To be properly used, however, data, must possess certain characteristics (Chapter 3). The valorization of them comes through the implementation of a data strategy (chapter 4).