

Chapter 10

Statistics and Analytics Management

ABSTRACT

This chapter introduces the concept of statistical analysis and analytics management in the context of food and beverage data analysis and business decision modeling. It lays the foundation for a broad understanding of statistical analysis in general, the meaning of analytics, and the advantages of using statistical data analysis. It emphasizes the relationship between a statistical application, analysis, and business relation using basic statistical information in the decision-making process. It shows various formulas, tools, and techniques for self-conducted analysis in small and medium-size foodservice operations.

1. INTRODUCTION

This chapter introduces the basic principles of statistical analysis and business analytics for foodservice managers and foodservice operators. It introduces basic statistical methods, tools, and statistical techniques as they relate to a foodservice operation. It highlights the importance of control and risk management by applying elementary statistics and understanding how businesses can be affected by dreadful events that could have been predicted and prevented. Just as in every other business, the management of a foodservice company is compelled to either employ an executive with basic or even advanced knowledge of statistical analysis or to hire an expert from outside the company (Pagano, 2012).

The chapter discusses, to a certain extent, the meaning of statistical analysis, which is an integral part of a company's success, and how to apply statistical analysis to their department or operation to avoid pitfalls that can lead to severe negative consequences, more than often, irreversible. The chapter further provides useful information and references about statistical analysis techniques, how to apply them, what the results mean, and to a certain extent, how to take preventive or corrective actions. Foodservice managers need to allocate ample time to analyze the daily, weekly, monthly, yearly, and time-series results and compare them to other departments where applicable to other properties in case of a multiunit operation and industry-related data the results that the organization is obtaining. These statistical analysis

guidelines can be applied in a single food service establishment for self-analysis, by the unit manager of a multi-unit operation or by the foodservice/director of food and beverage in a hotel operation.

In recent years, we have experienced many emerging trends in business schools, from redesigning their programs around shorter and modular courses to introducing quantitative methods. Foodservice business schools have followed suit and included quantitative data analysis and undergraduate level and graduate level. The course modules include elementary statistics using Microsoft Excel and other spreadsheets add-ins and advanced statistics to using more advanced statistical analysis software such as SAS, SPSS, and others.

The aim of this chapter is to provide the student practitioner with basic information about business-related statistical analysis focusing on the practical application of data analysis useful to decision making (Lewis-Beck, 1995). This chapter deals with fundamental and straightforward theories based on information gathered from the field. The examples presented are easy to understand and simple to apply, especially for hospitality professionals who do not embrace mathematics discipline. Foodservice managers often observe problems and associate some prior actions or decisions with the problem's cause. For example, if an advertising campaign for a chain restaurant introducing a new menu happens to coincide with the drop in sales, some foodservice managers may drop the ad campaign quickly without any further analysis. If the sales in some divisions fell from the previous year, the regional manager may blame the sales and marketing staff for not working harder in promoting the new menu. It would be very erroneous to generalize the results of a single event or observation.

A much better approach would be to analytically measure the effort of the ad campaign by applying simple statistical analysis techniques. For example, if the advertising campaign has not increased sales, the campaign expenses and the present business volume must be analyzed to understand the negative effect. If the campaign caused a positive effect, then a simple analysis could explain the relationship between the variables of, e.g., "advertising expenses increase of 5% and an increase in sales of 10%".

Because the increase in sales was a positive outcome, the manager should capitalize on the positive experience by analyzing all related factors as a base for a more successful campaign. Taking such a scientific approach can provide an insight into the understanding of the relationship among the many factors contributing to an event leading to making better decisions. For many managers, thinking statistically may mean additional workload, unnecessary bureaucracy. However, practical experience shows that statistical analysis is not performed based on lack of time alone; they simply lack the knowledge about elementary statistics and how to deal with data and information effectively. Furthermore, even when managers are provided with data gathered through sales records, payroll, customer relations databases, they may not use the data to make sound business decisions. Therefore, understanding statistical processes, knowing how to interpret data, and simulating decision modeling, is essential for the foodservice manager of the 21st century (Bache & Lichman, 2013).

Finally, the author wishes to emphasize that although the chapter focuses mainly on using outside resources for the application of business analytics, it also provides classical tools such as measurement factors and formulas for the conservative practitioner to use.

What is Data Analysis, and Why is it so Important?

Firstly, one needs to understand what data analysis means. The literature offers many definitions of data analysis. The author describes it as: "*Data analysis is the process of collecting, organizing, analyzing, interpreting and presenting data to emphasize the attention to useful information, proposing conclusions,*

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