A framework for designing new products and services

Abstract

Customer satisfaction is an important objective in all areas of business and services. A key issue in today's design activities is to achieve customer satisfaction in an economical way by finding the attributes that are most valuable to customers. In this work we propose a formal and efficient methodology to design a new service, which is an improvement from a platform service.

We propose a methodology to link two tools, the statistical design of experiments (SDE), for data collection, and the quality function deployment (QFD), for the development of conceptual alternatives. The focus is only on functional dimensions, but it can be used in symbolic and aesthetic dimensions. The study uses a recent survey on the development of an Operations Management course curriculum to illustrate the conjoint methodology

Keywords: Service design, statistical design of experiments, quality function deployment, derivative services.

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Introduction

A company designs its products and services to distinguish them from competitors' offerings as well as to conform to changing customer tastes and to meet legal requirements. Teams of people from diverse backgrounds (such as marketing, operations, consumer groups and supplier goods) are brought together to design new services. Marriott successfully used the project team approach to design its line of economy hotels (Murdick, Render and Russell, 1990). Studies in the management of technology suggest that cooperation and communication among marketing, manufacturing, engineering and R&D leads to greater new product success and higher product profitability (Griffin and Hauser, 1992). This is because specialists in each of these fields provide knowledge about the dimensions of attributes that configure a product: Engineers have knowledge about usability, designers about style and marketing professionals about symbolism (Rafaelli and Vilnai-Yavez, 2004).

The term "design" expresses the different aspects of the structure of an object, as well as the choice about various parameters by means of which the object is created (Rindova and Petkova, 2007). Design serves various purposes: it is used in existing or new markets to develop new products and improve the quality of existing products or services. Service and product design literature explains this broad range of possibilities (i.e., Ulrich and Eppinger, 2004). A new product design process is usually managed by a project. Wheelwright and Clark (1992) divide new product projects into two types: fundamental research or commercial development projects. The latter projects are divided into three categories: breakthrough, platform, and derivative projects. This spectrum can be separated into two categories of projects, where projects in each

category have broadly similar development challenges. On the one hand, there are novel products, breakthrough, and platform projects, and, on the other hand, derivative products (Tatikonda, 1999). Other authors also suggest a similar classification into two groups: radical and incremental innovations (Adler, Mandelbaum, Nguyen, and Schwerer, 1995, Rindoka and Petkova, 2007).

According to Wheelwright et al. (1992), a project to develop a novelty product involves significant changes to existing products and processes and has higher levels of technology development and greater market uncertainty. This product serves as a potential basis for the development of other variations, the so-called derivative product, where projects have smaller and limited changes, and, therefore, require fewer resources for their development (Tatikonda, 1999). Marketing uncertainty arises from the degree of technological change affecting the extent to which an innovation is likely to be perceived as incongruous by customers (Rindoka and Petkova, 2007). In a series of case studies, Dougherty (2001) observes that successful product innovation is a creative process involving successive cycles of learning by customers and producers. She notes that in markets for novel products, customers may not be able to articulate their needs, and that these needs may change over time as they learn to use the products.

From the product/service life cycle theory perspective, new platform projects are more likely to occur early in the first stage of the product/process life cycle, whereas derivative projects are more likely to occur later in the life cycle (Bloch, 1995).

The objective of service designs is to satisfy the customer's needs and expectations. The marketing department is usually responsible for obtaining data from customers, using an informal or a formal market research, with the aim of understanding and identifying customer's needs and expectations (Zirger and Hartley, 1996). The descriptions of these needs are the performance specifications. Performance

specifications describe "what" types of things (and to what degree) the product must provide to the customer and "how" the product does these are design specifications. Following Rafaelli and Vilnai-Yavetz (2004) these performance specifications can be functional, symbolic, and aesthetic dimensions and all these dimensions interact mutually to affect the customer's perception of value (Rindova and Petkova, 2007). Design specifications determine what type of service will meet these performance specifications, bearing in mind that even physical artefacts can generate emotional responses in customers (Bitner, 1992). These specifications are later translated into operations such as input to provide a product or service for customers.

This study proposes a formal and efficient methodology for improving an existing service, a derivative service from a platform design. We propose a methodology to link the use statistical design of experiments (SDE), for data collection, and the quality function deployment (QFD), for the development of conceptual alternatives. Pullman, Moore, and Wardell (2002) propose the theoretical relationship between Conjoint Analysis (a technique derived from SDE) and QFD as new product designer, but they do not develop this. In this work, we focus our study only on functional dimensions; without considering the other dimensions that are equally important in designing a new service. For instance, symbolic dimensions are in close relationship with brand and perceived image of the service, aesthetic dimension refers to the choice of colour, material, and proportion of a product, and is also known as industrial or aesthetic design (Bloch, 1995). In services, the aesthetic dimension usually relates to servicescapes. Servicescapes are the architectural space and surroundings in which customers receive the service (Bitner, 1992).

To illustrate this procedure, we took a project for the improvement of a Master program. The Department of Business Administration of the UPC has been trying, the last nine

years, to teach a Master program that could be considered as a complete picture of the operations management (OM). The Master Program ENGIPLAN is at present being carried out in the four biggest cities in Spain: Barcelona, Valencia, Bilbo, and Madrid, with an average of 100-125 students per program. Every year at the end of the course, students evaluate the ENGIPLAN program characteristics in a questionnaire supplied and make suggestions about areas and contents that they consider should be improved. Based on these suggestions, the design for the improvement of service was set out.