Extending classical statistical methods to study customer satisfaction. An application to a private indoor climbing centre in France

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Abstract keywords

Customer satisfaction study, Statistics, Importance-performance analysis, Tetraclasse model, Lasso.

Background

For managers, it is crucial to identify the key drivers that determine customer satisfaction. Importance-Performance Analysis (IPA) is a simple albeit effective tool to allocate scarce resources. The three-factor theory of customer satisfaction nevertheless suggests that the study of the relationship between attributes performance and overall satisfaction is more informative (Kano, 1984).

Aims

The paper will review and extend some classical statistical tools for studying customer satisfaction: IPA and the tetraclasse model (TM; Bodet, 2006). An innovative data learning technique, the lasso, will also be presented.

Research design

A customer satisfaction survey was carried out in November 2011 in the biggest French private indoor climbing centre. A census method was used during one week long (n=921). The questionnaire comprises in particular 25 attribute importance measurements and 25 corresponding performance measurements, each defined on a 4-point Likert scale. These variables describe primary and secondary services, service quality and atmosphere. In addition, overall satisfaction was evaluated. Initially rated as a 10-level Likert scale, it was later recoded as a 4-category ordinal variable.

Methodology and data analysis

IPA studies quality attributes on two dimensions: their performance level (satisfaction) and their importance to the customer. The resulting scatterplot helps to set high and low priorities, and possible overkill. Yet, this EPA display heavily depends on the survey sample size and the variability of both importance and performance measurements. It seems thus interesting to add some confidence intervals to study the robustness of this analysis (Farnum & Hall, 2007). Moreover, some market segmentation by sporting expertise or occupation can be also tested and depicted using the IPA plot.

To study the relationship between an overall satisfaction measurement and attributes performances, the Llosa's TM employs a correspondence analysis. It is here proved that a similar plot can be obtained using basic percentage computations. Moreover, the resulting scales are easier to interpret and introduce light and shade into manager decisions. Supplementary confidence intervals can again be drawn.

When overall satisfaction is measured on an ordinal response scale, the proportional odds model is a suitable regression tool. To select the most significant attributes performances, automatic selection algorithms are commonly used. However, when the number of explanatory variables is high, selection procedures exhibit a high variability. A different and innovative technique is presented: the lasso (Archer, 2011). By penalizing the coefficients size, more robust estimations are obtained. Plotting the coefficients against the penalizing parameter gives an idea of the results stability. Information criteria help to select the best-fitting model. Standardized coefficient (beta) could then be printed, plotted and interpreted.

Furthermore, to detect the asymmetric impact of attributes performances on overall satisfaction, dummy variables can be introduced to identify excitement, performance and basic factors (Matzler et al, 2004).

Results

IPA indicates that satisfaction and importance are usually high for core services (good and varied routes, route renewal). On the contrary, price, cleanliness and waiting time are considered as important but not so well satisfied. These three attributes and the fitness room (not important in IPA) are classified as "plus" by the TM. The core services and also conviviality and reception quality are considered as "basic". Advices, supervision and equipment renting seem to be key factors (for beginners). The lasso shows that overall satisfaction is a function of price, core services, reception quality, conviviality and cleanliness.

Discussion and implications/conclusions

The private indoor climbing centre must clearly concentrate its resources on its core services and does not try to become a general leisure centre. Human resources, mostly recruited for their sporting diploma (climbing), must be trained to customer relationship. A particular attention must be given to beginners.

The IPA, the TM, the lasso analysis impact of each attribute's performance on overall satisfaction and the asymmetric impact analysis will be compared, emphasizing their respective strengths and weaknesses and the different kind of results that can be obtained. It seems nevertheless difficult to give a definitive answer to the question of the best approach. Depending on the manager goals, the measurement scales, the sample size, the prior knowledge about the attributes dimension and the mathematical sophistication of the user, advice may vary. In our mind, the four analyses are more complementary than rival to yield prescriptions for customer satisfaction management.

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