

A conceptual framework for using marketing models for sustainable development

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Abstract: *Marketing models are becoming increasingly popular among both marketing scientist and practitioners. In a world where data is easier to collect and analyse, the marketing models can provide a more efficient way to gather relevant information. By providing means to address the future, marketing modelling can become an important tool for sustainable development. The present paper aims at providing a conceptual framework that can guide future steps to more relevant and efficient marketing models.*

Key-words: *marketing models, sustainable development, strategic marketing.*

1. Introduction

Marketing modelling is the best approach to market and customer analysis. The marketing model has the unique ability to predict the future actions by using data already available. The science of marketing is looking for better ways to extract information and predict market change or customer behaviour. Marketing modelling is the fourth level in the marketing management context. The first marketing approach was based on entrepreneurial skills and flair. The second stage started to use data to back-up the marketing decisions. Those data were gathered from internal sources like sales reports or accounting documents. The marketers realised the importance of the customer and its interactions with the product and its characteristics and, in the third stage, the marketing research started to be used to gather those information. But the information addressed present and past market situations. The fourth stage is trying to create ways to predict the future by combining data about past and present situations into marketing models.

Given this perspective the marketing models are the next step in marketing research and all the data flooding is enforcing this change. But the lack of structure of the marketing models field is an important drawback for scientists and practitioners as well. Therefore, a better framework, correlated with the principles of

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the sustainable development can further develop the use of marketing models as tools for an efficient growth.

2. Literature review

Theoretical modelling in marketing is a method used to create a complex perspective on a market situation. As defined by Lilien, a theoretical model is a “set of assumptions that describes a marketing environment.” (Lilien et al, 1992). These assumptions can focus on all the marketing aspects and even if a model is not clearly stated the modelling methodology is used in every marketing decision as the marketing environment is too complex to work with all the parameters. Therefore the market situations are simplified and verbal or mathematical models are used to reach a conclusion. It is common to split the decision in several steps described by different models (Enache, 2012). One of the best examples in this situation is the customer behaviour relative to a purchase. Such behaviour can follow a five step strategy starting with the need arousal until reaching post-purchase (Kotler, Fox, 1995). At each step a different model can be deployed:

Need arousal	Stochastic Models of Purchase Incidence Discrete Binary Choice Model
Information Search	Individual Awareness Models Consideration Models Information Integration Models
Evaluation	Perceptual Mapping Attitude Models
Purchase	Multinomial Discrete Choice Models Markov Models
Post-purchase	Variety Seeking Models Satisfaction Models Communications and Network Models

Table 1. *A framework for classifying consumer behaviour models (Lilien et al, 1992)*

The application of models in customer analysis can lead to a better understanding of customer lifetime value (Berger, Nasr, 1998) and it can predict customer satisfaction, customer retention and their impact on market share (Rust, Zahorik, 1993). It is obvious that customer heterogeneity is an issue that needs careful consideration and marketing models are using different perspectives to address the complexity of customer typologies (Allenby, Rossi, 1999; Ho et al, 2006).

Marketing models can offer useful insights on topics like service marketing (Rust, Chung, 2006) or strategy and policy design (Park, Keh, 2003; Wieringa,

Leeflang, 2012). It should not be forgotten that the marketing models field is still developing and important mathematical solutions are not used in this field (Steenkamp, Baumgartner, 2000).

Sustainable development is the current framework used to tackle the growing problems arising from business objectives, on one side, and business impact on the environment, on the other (Hopwood et al, 2005). This situation is also fuelled by the changing attitudes and expectations of the customer (Dobson, 2007). In this context, the marketing models can offer better ways to address marketing strategies. It can sustain efforts to validate sustainable market orientation (Mitchell et al, 2010). In the search for sustainable competitive advantage, the marketing models can offer alternatives for benchmarking (Vorhies, Morgan, 2005). The sustainable marketing field is based on a new approach of marketing issues. It emphasizes the importance of a long term strategic thinking and consistency (van Dam, Apeldoorn, 1996). It also introduces the concept of corporate social responsibility and links it to market orientation (Mahmoud et al, 2014).

3. Conceptual framework

In order to take advantage of the analytical power of a mathematical model, the marketers are supposed to adapt a mathematical framework to marketing issues. In this situation there are two major challenges. First, in order to obtain correct information about a phenomenon, the data should be reliable and correct in relation with the model characteristic. Both the data and the model are supposed to be in strong connection with the research objectives. It is important to note that in order to obtain a correct model the correct data is needed. This implies that the model used will be chosen before collecting the data and even before creating the survey. Second, given the complexity of the marketing issues, the model should be optimised continuously.

To address these two challenges, a framework has to contain at least three major steps. All the actions are expected to be based on and comply with the research objectives.

The first step in order to create a marketing model is to choose the appropriate one for the current market situation. At this point it is important to understand the rules that govern the market situation. This can be obtained by qualitative analysis of the phenomenon, literature review, etc. A verbal model is sufficient as it will clearly state the input variables and the expected results. This step should take place before the stage of questionnaire design as all the necessary variable input should be measured with appropriate scales. The balance between needed data and variables characteristics can become an issue especially when the variables are nominal or ordinal.

The second step needed in order to create a model emphasizes the importance of the data collected. At this step the data should be cleaned, validated and analysed by means of descriptive statistics.

The data cleaning process will improve the quality of data by removing problems related to acquiring data and database creation. This first step will ensure that all the available data is considered and the mistakes are either solved either removed from the database. The problems that occur can have different sources (Rahm, Do, 2000) but several tools can provide a framework to complete this step (Raman, Hellerstein, 2001; Chaudhuri et al, 2003).

The validation will focus on the reliability and accuracy of the data. At this point, the external validity of the data is questioned. The best ways to make sure that the data is both reliable and accurate are to check the sampling method and its' implementation and to compare the sample structure with population structure.

This second step will perform a descriptive statistical analysis of data in order to detect anomalies. By using descriptive statistics and by creating plots for the data previously unobserved situations, like outliers, this can be addressed and the process of cleaning can be restarted.

By having the data in the best potential configuration, it becomes possible to develop a mathematical model from the verbal one chosen at the first step. A verbal model can be transformed into a mathematical one by replacing the interaction with operators and by transforming the data into variables that can be handled by those operators. A simple example is given by the fuzzy logic marketing models where verbal operators like "and" or "or" are replaced by max and min. The same class of models offers a way to transform the data by means of fuzzification.

After choosing the model, the implementation process will take place. At this point it is important to follow the models' characteristics and to make sure that all the needed conditions are fulfilled. Having a first result will provide the feedback needed to adapt the parameters in order to match the reality. This process should rely on secondary sources of information and/or on test samples of data. For marketing modelling the calibration process is paramount as quite often the first model is not the best possible one.

One serious drawback of the marketing models created by researchers is the unusual small use of their results in practice (Lilien, 2011). It seems that the marketing models created by academic researchers are not relevant to the business they address. Without discussing the reasons for this situation, two solutions can be used to improve the adoption of marketing models and, therefore, their effectiveness.

The first approach will emphasise the visualisation of the models. Too often the models are a set of mathematical records with such a complexity that a practitioner will not be able to follow. In this case a good image representation of the model results can provide a powerful incentive to further question and

eventually adopt the model idea. This approach is heavily relying on statistical software able to perform such visualisations.

The second approach will emphasise the follow up of the marketing model. A great marketing model can take years to develop and even more time to obtain results. For example, the marketing model created for Daimler Chrysler by Silva-Risso and Ionova (2008) was developed in ten years but the claimed savings were about 2 billion dollars. Given this situations it becomes paramount to plan an optimization and calibration of a marketing model for several business cycles.

4. Conclusion

The marketing models are the latest way to address marketing situations. Their main advantage relies on the ability to reach conclusions about future developments and actions based on available data. The enthusiasm around big data, the development of better ways to collect data, the better tools developed for statistical analysis are arguments in favour of marketing models implementation.

Given the importance of the sustainable development, a tool which can predict the impact of future decisions and can improve them, a tool that can save time and resources, a tool that can be duplicated in a different business context, it can become the next approach to market situations.

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