Integrated Marketing Management
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Lecture – 17
Analytical Marketing System

Welcome to this class. In this class later we will first look at what is this Analytical Marketing System? What does it make use of?

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When we are looking at analytical marketing system we are looking at basically the statistical bank. In other words an analytical marketing system always makes use of a statistical bank. The next question comes what does this statistical bank involve? It involves multiple regression analysis normally, generally we are these are the things, which we make use of multiple regression analysis, then discriminant analysis

What do we mean by multiple regression analysis? We are looking at for example, the demand for a product in terms of different variables, which are likely to influence demand, take the demand for any product. The likely variables, which are going to affect or influence the demand, will be the price of the product 1, second is the availability of the product 2, third is the disposable income of the consumer to take this product. You can keep on listing.

The demand market demand for a particular product will be the dependent variable, it depends on, many independent variables like, the price, the place, then the different characteristics of the product, then the disposable personal income of the consumer all those types of things. When you regressed the dependent demand against all these independent variables you are essentially doing multiple regression analysis.

What are you trying to do by doing this? You are going to find out from the number of independent variables you have chosen, to explain the increase or the decrease in demand, what is the percentage that is getting explained. Suppose, you have chosen 4 independent variables, they explained 70 percent of the variation in the market demand. That is your R squared comes around 70 percent; that means, to say the number of variables, independent variables, that are being chosen explains 70 percent of the variation in the demand for the product ok, which is generally considered good in marketing.

Then the second one which we make use of is called the discriminant analysis, factor analysis is the third. What do we mean by saying discriminant analysis? We are looking at consumer traits, what could be an example for this? Look at the owner of a Maruthi 800 car, vis a vis the owner of a Benz. What are the types of characteristics you can distinguish clearly between the owner of a Marathi 800 car and a Benz car owner?

The first thing which you can make out is the income category in which these two consumers are likely to fall will be very different. Second thing which you can see is their social characteristics, that is the way they mix with the social class of people may also be different. So, all these factors are captured using discriminant analysis. The traits of the consumer for different products, some of the products may be luxury products, some of the products may be essential products.

These are these different traits are really captured using discriminant analysis, which also makes use of multiple regression incidentally. The third one which we do is factor analysis. In this factor analysis, what are the instead of the single independent variables we group them into factors, because some are all factors all variables, which are effect, which are concerned with price, we group them under one factor say factor 1. All factors concerned with income we group them under one more factor say factor 2.

Again, the dependent demand is explained in terms of different factors, when do you resort to factor analysts is the next question. You resort to factor analysis when the number of variables is more and you want to condense them to different factors. You group these variables under different heads maybe group 1, group 2, group 3, group 4. And, using the same multiple regression analysis, you use a factor analysis instead of the independent variables; you make use of the factors to explain the variation in the dependent factor or the dependent variable.

The cluster analysis is the next one which we do; an example for this would be your automobile groups. There will be different automobile groups; one is the small car group, second is the midsize car group, third is the luxury car group, maybe 4 you can have it as a what do you call the SUVs. Group these all these under different clusters. And find out, how the demand for these clusters are changing using these different groups.

Suppose you are looking at the demand for one cluster. How the other clusters are affecting this demand? Then, the next one which we make use of is what is called a conjoint analysis. What do we mean by a conjoint analysis? We look at designing, an appealing product for a target market. We look at all we do not want to come out with their product just for the sake of coming out, we have specified at target market for that target market only some products will have product appeal.

When these products have product appeal the conjoint analysis looks at designing an appealing product for that particular target market. Maybe you are a user of a sports car. You are looking at a sports car for a particular segment those who are fond of driving that very high speed. They will when you are designing this sports car for this particular target market, you include certain special characteristics in that product.

Though it is growing at a very high speed, it should be able to brake immediately without hurting the driver, even with all that many times in the car races the driver gets hurt. The car gets becomes startle all those types of things still happen, but when a product is designed having this type of a target market under consideration, we make use of this conjoint analysis. Some of the cars like this Porsche from Germany, which are being designed always having a target market appealing to that target market making use of these different types of marketing system models.

Basically, these are statistical banks which we make use of to analyze the market. The objective of the statistical bank is to help in analysis of the market. What has been listed here is some of the different types of analysis that can be done? These are used depending on the situation that you are going to encounter. You may use a multiple regression analysis, or a discriminant analysis, or a factor analysis, or a cluster analysis, or a conjoint analysis depending on the type of situation that presents to you in the market place.

The second one which we make use of is what is called the descriptive models? What do we mean by descriptive models? We look at two types of descriptive models; one is the macro, second is the micro. When we say macro, we are looking at a holistic level that is a picture at the holistic level. Suppose, you can consider sales as the dependent variable, you may look at national income; you may look at average price and company advertising expenditure as independent variables. These are the links which explain the variations in the dependent variable again you still may resort to a multiple regression analysis.

Any are looking at a macro picture you specify minimum number of links you do not specify too many links. You specify those links which are very important for consideration. On the other hand, when you come to micro what is going to happen is you specify more links. You expand giving more links to the micro model, micro descriptive model. In addition to the micro model you may use something like the micro behavioral model, what is this micro behavioral model? This is where operations research comes to the help of marketing.

Ultimately not that everything rewards whether it is the statistical bank or the descriptive models the ones we go further like the decision models, or the heuristic method, or than linear mathematical models all of them are concerned with the markets. We are ultimately looking at the markets only, because markets dictate the survival of the firm or the demise of the firm.

In a competitive market, a firm has to survive the competition; when need is to survive the competition, you have to look at all these models to help it keep itself assured or keep its neck out in the whole marketplace, that is neck up, you cannot keep your neck down

in the marketplace, because there is stiff competition, then you will be bulldozed by the other players.

Whatever it calls for whether it is market research our analytical marketing system or the different types of models which we are discussing. The company has to adopt in other words marketing place a very important key to the survival of the firm. This is what we are seeing in a city like, Bangalore where there are many software firms. What are they looking at they are looking at all these types of models day in and day out; and they are calling it marketing analytics or big data.

Essentially, they are looking at these types of models to find out how does the consumer behave, if you really see even in a world cup cricket match. Many analytical models were designed to find out, what should be the optimum timing of an advertisement which should come, which will not distract unduly the viewer, but still remain in the mind of the viewer. All of these types of things are coming under the realm of marketing analytics.

The micro behavior model makes use of the or models, the or models are basically these two are commonly made use of one is called the Markov process, the second is called the queuing models. What are you trying to do in all in these models suppose there are so many servers? Giving the same type of service, then if you are in the queue, which server is likely to serve you comes in this whole model scenario so, server 1, server 2, server 3. And, how much time he is going to take for you for the service?

You are looking at the average rating time in the queue, plus the service time that is spent by the server on you. In the whole process what are you getting, you are getting what is the time that you spend for a one for one customer for one service. This is where many of these, if you look at the Bangalore airport, the Kempegowda International Airport you see so many planes landing and taking off every 2 minutes.

When you see these planes landing, the passengers have to disembark from the aircraft, then their luggages have to come to the different conveyor belts, then the aircraft has to be cleaned kept in good condition, for the set of consumers or customers to embark the aircraft it moves to the next to destination. All of this takes place in a very systematic manner.

When you are looking at an analytical model, you are looking at so, many factors in this process, which are likely to disturb the turnaround time of their aircraft, that is increase that turnaround time of their aircraft. Any link in that supply chain. Suppose it causes some disturbance, then the time taken for that particular supply chain activity will increase, the result is the turnaround time for their aircraft is likely to increase.

The next type of models that we are going to look at makes use of mathematical routines, these are called decision models, or optimization models, using mathematical routines, these mathematical routine models can be categorized under 4 categories. One is differential calculus, second is mathematical programming, third is Bayesian analysis, fourth is Game Theory. We will look at some of these models when we go along. The other types of models that you can make use of is what is called the heuristic models.

What is this heuristic models? They make use of computational routines many times you write an algorithm to solve a particular situation. You write an algorithm and that algorithm goes through different routines, and this gives you how the dependent variable is going to get affected. These different computational routines many times may make use of different aspects like the branching or the looping, wherever it is required ok.

This is the other set of models, the last set of models which we make use of in marketing is the mathematical models. What do these mathematical models give? It looks at linear and non-linear, that is linear regression non-linear regression. Linear regression means, it follows a straight path, non-linear it does not follow a straight path. Then may we may look at the static model and dynamic model. Static model where we look at one particular time horizon a dynamic model, we are looking at different time horizons it is a continuous one.

Then you may look at a deterministic model or a stochastic model. What is a deterministic model? You are making use of the different attributes of the product to determine, that is to say exactly how much the dependent variable is going to influence. It is a deterministic problem it is a deterministic probability. What is a stochastic probability? In fact, when you look at deterministic probability, that probabilities itself is not there it is the whole whatever you have arrived at is deterministic.

Suppose, you say this particular variable is going to influence the demand by 25 you are you are determined or you have found out that this is the variation that is going to come

with respect to the demand using this particular way, when you use this stochastic method you attribute up probability for that, you say this may affect that the mind say by 20 percent.

You will give a probability of 0.2 for that, then you look at the other different variables give them different probabilities, when you give all these different probabilities, you are looking at an LP, that is a linear programming model making use of a stochastic process, that stochastic process makes use of different probabilities to address the situation. So, this is these are the different types of models, that you are going to look at in an analytical marketing system.

As a recap all this we make use of statistical banks. The statistical banks helping developing a model bank, these statistical banks basically make use of multiple regression, discriminant analysis, factor analysis, cluster analysis and conjoint analysis. When we moved to the descriptive models we look at 2 types of models initially, that is we look at macros macro models, where the links are limited, then we look at the micro model, where the links are more, then we may want to again looked at a micro behavioral model, we look at the behavioral picture also.

You have more links you have the behavioral aspect coming in. There the OR portions coming and here we make use of the Marco process and the queuing models, when we look at the decision models, we are looking basically at the optimization models, these optimization models look at differential calculus, that is make use of differential calculus, mathematical programming Bayesian analysis and game theory. These are called mathematical routines. Then we may also make use of heuristic models when we use computational routines.

We also make use of mathematical models where we use the linear programming and the non-linear programming, it can be static or dynamic, it can be deterministic or stochastic depending on the type of models that you are solving. These are basically the worst gamut of analytical marketing system activity that is taking place in the realm of marketing in the present-day context. All this is getting grouped under this broad terminology called marketing analytics.

Any recruiter in the present today is looking at analytics, that is he is looking at ‘if I recruit this person how useful is this person going to be for the organization’? Kindly

note that everything revolves around marketing and he is looking at you are usefulness to solve many of the marketing related issues which might come in. He is trying to address how you can improve the sales for him and consequently how his profits can improve.

Kindly note that no firm is functioning in vacuum, no firm is trying to say everything I am doing for a nonprofit activity; a business is a profit making activity, whether one likes to say it or not you have to look at business as a profit making activity and in a business situation, it is not considered bad to make profits out of a business.

In fact, right now the more profits you make the more you are contributing to the GDP of the nation ok. This is a type of scenario which you are likely to have. These broad fields of marketing analytics are addressing all these questions, then when you are looking at a scenario where large amount of data is coming in with respect to the organization.

The size of the organization increases sometimes the size might be medium also, but still the data that you may have to handle might be very large. That is where you make use of your big data analytics; so, all these coming under the terminology of analytical marketing systems. We stop here we will continue in the next class ok.

Thank you.