Business Development From Start to Scale
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Week - 04
Market and Competitor Analysis
Lecture - 19
Demand Forecasting

Hi friends, welcome to the NPTEL course Business Development from Start to Scale, we are in week 4 with the theme of Market and Competitive Analysis. In this lecture the 19th in the series we discuss the very important topic of Demand Forecasting.

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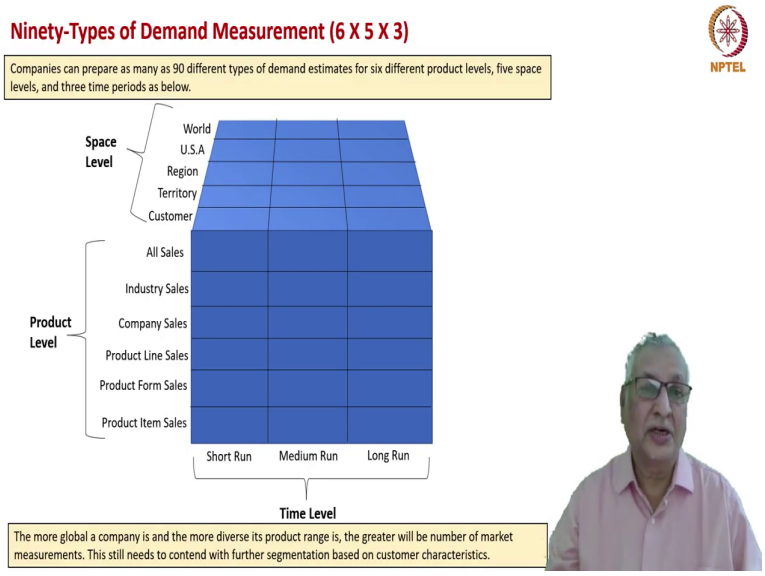

Understanding of the demand is at the core of business development. One can look at 90 types of demand measurement as I have indicated in this example that shows how complex

demand forecasting process can be. Let us look at three types of time levels; short run, medium run, long run.

Different companies define these in different ways some companies will consider 1 year as the short run and some 1 to 2 years. Some companies will look at 2 to 3 years as medium run and some companies look at 2 to 3 years as the medium run and some look at three years and beyond as the long run.

So, whatever that be every industry every company has its own understanding and perception of what these time spans are, but at the product level there could be several factors that may vary depending upon the time frame chosen, it could be at the lowest level the product item sale moving to product form sale, product line sale company sale, industry sale and all sales together.

And the regions which are covered in the demand forecasting exercise could be the customer itself the territory, the region, USA and the world. The more global a company is and the more diverse the product range is the greater will be the number of market measurements.

This still needs to contend with the fact that further segmentation can be achieved or required based on customer characteristics and this is not unusual this is very much usual for every type of company.

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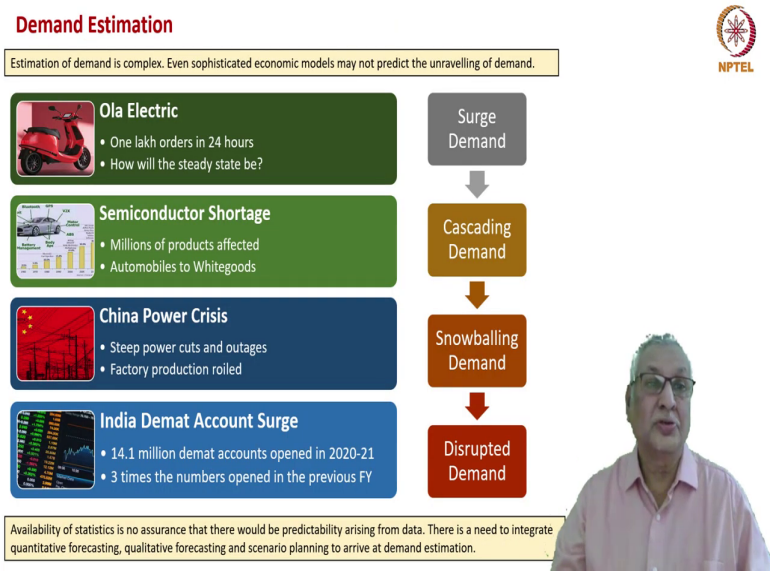

So, demand estimation which is a complex process is the core of business development. At times even sophisticated economic models may not predict the unraveling of demand. Ola electric has had one lakh orders in 24 hours when it announce the digital launch of its scooter. But the question is how long the steady state will remain?

There is semiconductor shortage even now two and a half years after this semiconductor shortage first popped up. Millions of products have been affected in terms of loss sales, automobiles to white goods were impacted by the semiconductor shortage. Can we predict when the semiconductor shortage? Will really go away it was difficult at least 1 year ago.

China power crisis as well as the COVID lockdowns, steep power cuts and outages industrial disruptions, factory production is roiled. Can we predict when the items will ease? India's Demat Account Surge; fourteen point million demat accounts were opened in the period

2020-21. These were 3 times the numbers opened in the previous financial year and no one could predict this level of interest in the stock markets of India.

So, there are four types of demand; surge demand the one like the demat account surge, cascading demand depending upon how the economy impacts a particular product and therefore, the sub products and the components how they are affected is the cascading demand aspect.

Snowballing demand that is something is favored and the demand for it keeps on moving up the kind of one year waiting period you saw for Rakia (Refer Time: 03:57) product is a snowballing demand. Everybody thought that it offered features for greater than the price at which it was marketed therefore, there was a snowballing demand disrupted demand that is when the demand gets disrupted by something which is completely out of the blue.

Availability of statistics therefore, is no assurance that there would be predictability arising from the data, there is a need to integrate quantitative forecasting which is of course, essential with qualitative forecasting as well as scenario planning to arrive at proper demand estimation.

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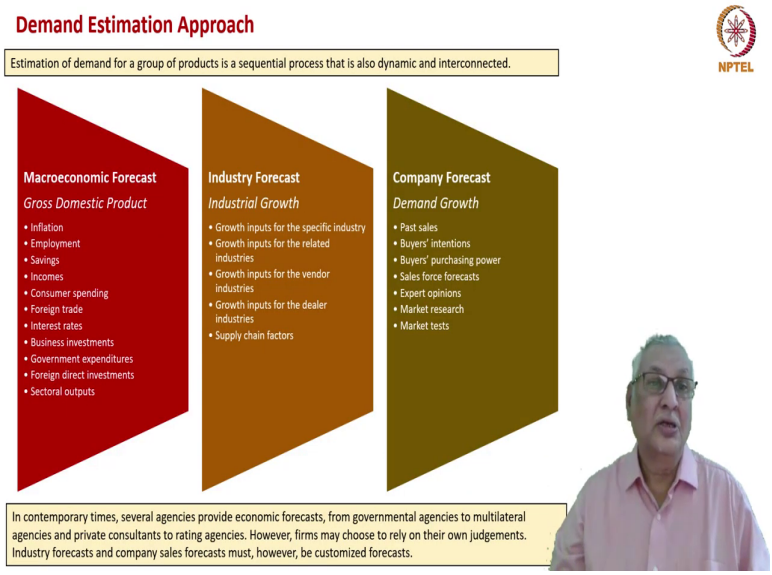

What are the approaches that are available for demand estimation? It is actually a progressive approach. We have to first look at the macroeconomic forecast that is the gross domestic product that would be occurring in the economy and that must take into account several independent variables such as inflation, employment, savings, incomes, consumer spending, foreign trade, interest rates, business investments, government expenditures, foreign direct investments, sectoral outputs.

Then you have industry forecast which is industrial growth for that growth inputs for the specific industry, growth inputs for the related industries, growth inputs for the vendor industries, growth inputs for the channel industries and supply chain factors, then comes the company forecast the demand growth.

Past sales, buyer's intentions, buyer's purchasing power, sales force forecasts, expert opinions, market research and market tests these are not comprehensive factors, these are suggestive factors. In contemporary times several agencies provide economic forecasts these range from governmental agencies to multilateral agencies and private consultants to rating agencies.

However, firms may choose to rely on their own judgments, industry forecasts and company sales forecasts must however, be customized forecasts.

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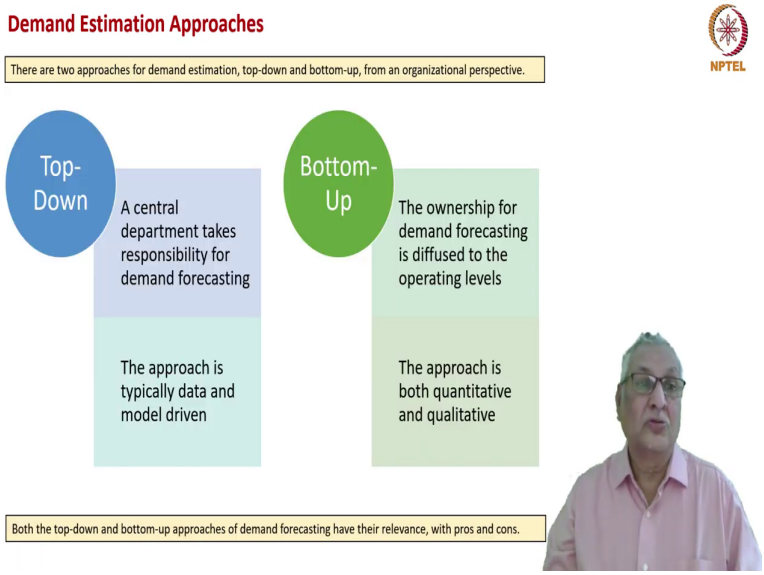

What are the demand estimation approaches? Basically, there are two types of approaches for estimating demand; one it top down. In this approach a central department which is well qualified and well equipped takes responsibility for demand forecasting and it goes through

these three phases of demand forecasting which I mentioned earlier that is economic forecast, industry forecast and therefore, the company demand forecast.

This approach is typically data and model driven. In the bottom up approach the ownership for demand forecasting is diffused to the operating levels this approach is both quantitative and qualitative, both these approaches have their relevance with pros and cons.

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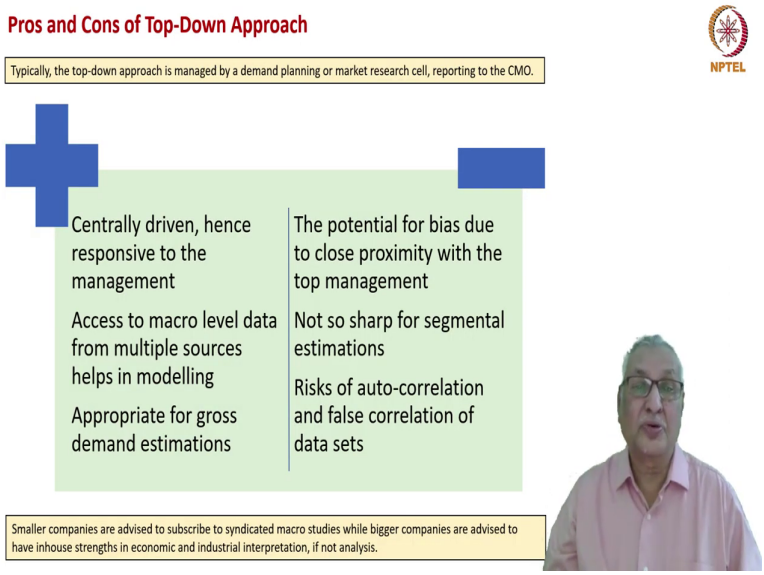

What are the pros and cons of the top-down approach? It is managed by department which is dedicated to quantitative techniques, economic understanding, understanding of various industries the linkages. In fact, that department looks at the whole economy and the industry including the firm as a system and they are able to provide the demand estimations in that background.

They also may be a centralized demand planning department within one function such as marketing and that may be undertaking a similar task this is centrally driven, hence very responsive to the management. It has access to macro level data from multiple sources and therefore, modeling is facilitated.

It is appropriate for gross demand estimations, but the negatives are that there would be a bias because of the close proximity with the top management. And also, it is not so sharp for segmental estimations, risk of autocorrelation and false correlation of data sets is very much a risk in this kind of approach.

Smaller companies are well advised to subscribe to syndicated studies of the macroeconomic environment and macro industrial environment bigger companies are well advised to have inhouse strengths in economic and industrial interpretation, if not detailed analysis.

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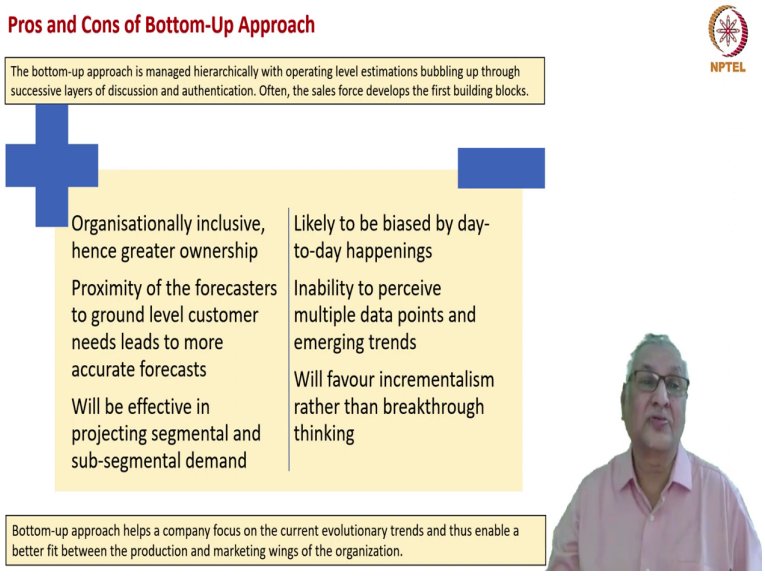

Let us look at the pros and cons of the bottom-up approach. The bottom-up approach is managed hierarchically with operating level estimations bubbling up through the successive layers of discussion and authentication often the sales force develops the first building blocks typically in an organization you have frontline sales offices.

They have area sales managers that is a cluster of sales officers is reporting in an any organization to the area sales manager and a few area sales managers report to the regional sales manager and a few regional sales manager report to the general manager and three or four general managers depending upon the zones that exist in the country's sales network would report to the sales head.

And the sales requirements as well as the sales projections are bubbled up from the bottom. Philosophically this approach is organizationally inclusive and hence it has greater ownership.

Proximity of the forecasts just to the ground level customer, it leads to more accurate forcast, it will be effective in projecting detailed segmental and sub segmental demand.

If you are planning the sale of an FMCG product in an area then you would know how the demand would vary between different neighborhoods of that area to that extent bottom approach could be helpful. But again, it is likely to be biased by day to day happenings, it is unlikely that the forecasters at the ground level have the big picture in mind.

They would be unable to perceive multiple data points and the emerging trends, they will favor incrementalism rather than breakthrough thinking. So, these are the disadvantages of the bottom-up approach, it is business as usual with some incrementalism that happens, they tend to react far more dangerously to the current disruptions.

And most exuberantly to the excitements that happen in the marketplace with none of these is good for the demand forecasting process. Bottom-up approach helps the company focus on the current evolutionary trends and thus enables a better fit between the production and marketing mix of the organization. So, there is space for bottom-up approach there is also a space for top-down approach.

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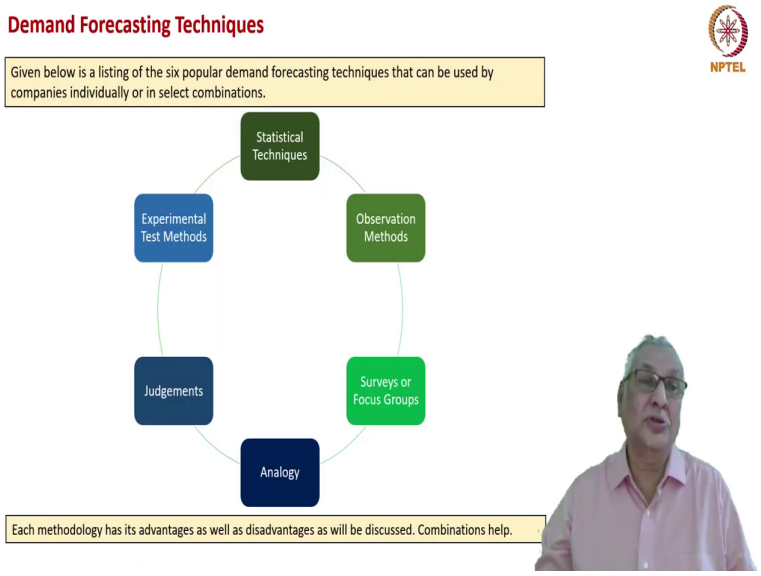

How do you juggle between these two approaches is the critical factor of demand estimation in a balanced way. There are 6 popular demand forecasting techniques that can be used by companies individually or in select combinations.

The first is statistical technique the second is observation method, third is survey or focus groups, fourth is analogy, fifth judgment and sixth is experimental test method. Each method has its advantages as well as disadvantages and these will be discussed. Certainly, combinations of several of these 6 techniques will help in getting at the right type of demand estimation.

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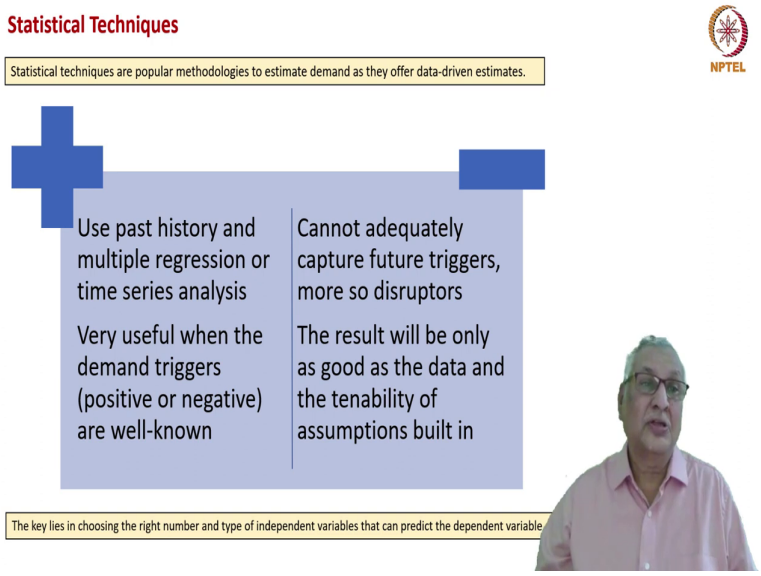

Let us look at the statistical techniques without doubt these are popular methodologies to estimate demand because they offer data driven estimates. They use past history and multiple regression or time series analysis. Very useful when the demand triggers, positive or negative are well known.

The negative about these kinds of techniques is that they cannot adequately capture future triggers more so disruptors. The result will be only as good as the data and the tenability of the assumptions that are built into the model. The key lies in choosing the right number and the right type of independent variables that can predict the dependent variable.

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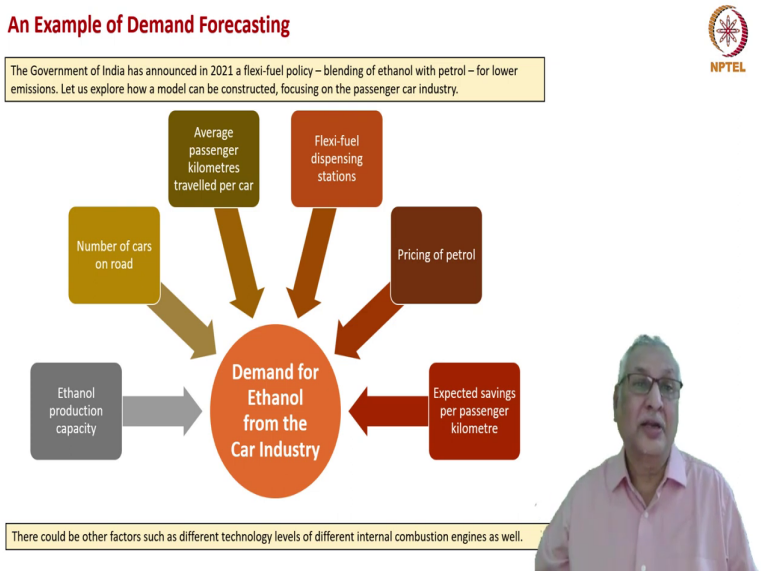

An example of demand forecasting for the flexi fuel policy that is blending of ethanol and petrol for lower emissions. Let us explore how a model can be constructed focusing on the passenger car industry.

So, the sugar mills which are the major producers of ethanol have this problem on hand the government has announced a 30 percent blend of ethanol in the petrol fuel for the passenger car industry. What would be the demand requirement of the passenger car industry out of the sugar mills? That is the question.

So, the equation will look at the following independent variables; ethanol production capacity, number of cars on road, average passenger kilometers travel per car, flexi fuel

dispensing stations, pricing of petrol, expected savings per passenger kilometer. You have certain assumptions for each of these independent variables.

And you create an equation to relate these independent variables to the dependent variable that is the demand. There could also be other factors such as different technology levels of different internal combustions as well. So, the complexity of the model can go up based on the data you are able to (Refer Time: 13:19)

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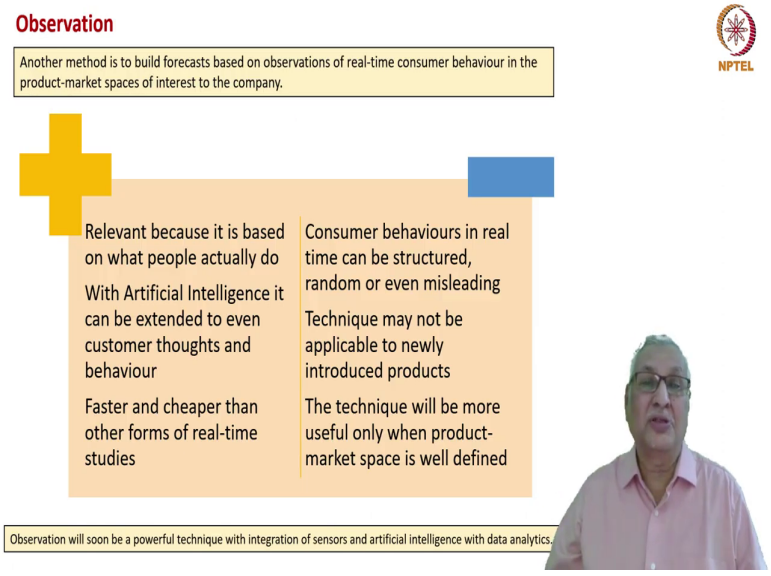

The second method is the observation method. In this we build focus based on the observations of real time consumer behavior in the product market spaces of interest to the company. You look at retail store scenario you go to a retail store you look at how the products are flying off the shelf and based on the promotion.

Let us say more products are taken by the consumers or in spite of the promotion the products are not taken by the consumers you get a feel of the brand power as well as the demand for that particular kind of product. Now, this is observational and it cannot be universal, it has to be based on certain sampling.

On the positive side observation is very relevant because it is based on what people exactly do in the marketplace at the point of sale. With artificial intelligence it is not necessary that people should be physically present artificial intelligence can help extend this to every customer who moves into the store and also govern the customer thoughts and behavior.

Thirdly it is faster and cheaper than other forms of real time studies. The negatives are the consumer behaviors in real time can be structured, random or even misleading just some curiosity may make you behave in a particular manner towards a product that does not mean that the customer is interested in buying the product or is influenced by the product.

Technique may not be applicable to newly introduced products some people may be interested and some people may be disinterested, the technique will be more useful when the products market space is well defined. Observation will soon be a powerful technique with the integration of sensors and artificial intelligence with data analytics.

Observation I believe is going to be the trend of the future in demand distribution and it is going to be very powerful as we move along.

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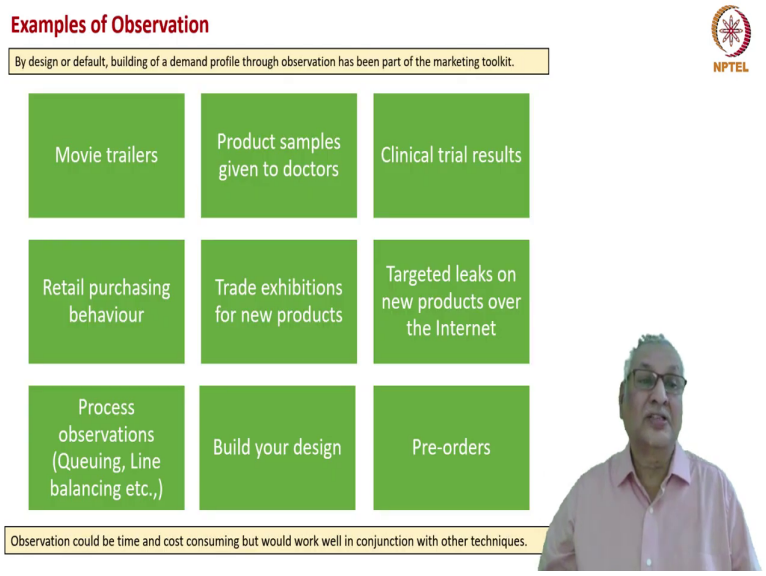

Examples of observation by design or default building of a demand profile through observation has been part of the marketing toolkit when a movie trailer is screened it is an observation of people's interest in that movie, when product samples are given to doctors and when they are administered to the patient it is an indication of the demand profile.

The clinical trials are an observation of the therapeutic efficacy of a pharmaceutical product. The retail purchasing power about which we talked about is an indicator of the latent demand in the marketplace. Trade exhibitions for new products the way people look at various products the way they come to various stalls are indicative of the companies brand equity as well as the product brand equity.

Targeted leaks on new products over the internet and the kind of views they generate the likes they generate or observational outcomes of such activity. Process observations that is

queuing, line balancing crowding around a product all of these things are observations related to the consumer demand.

Build your design that is allowing people to assemble their own product and feel happy about it is an indication of what kind of product customers would like to have. Pre orders is another example of observation; observation could be time and cost consuming, but it would work very well in conjunction with other techniques.

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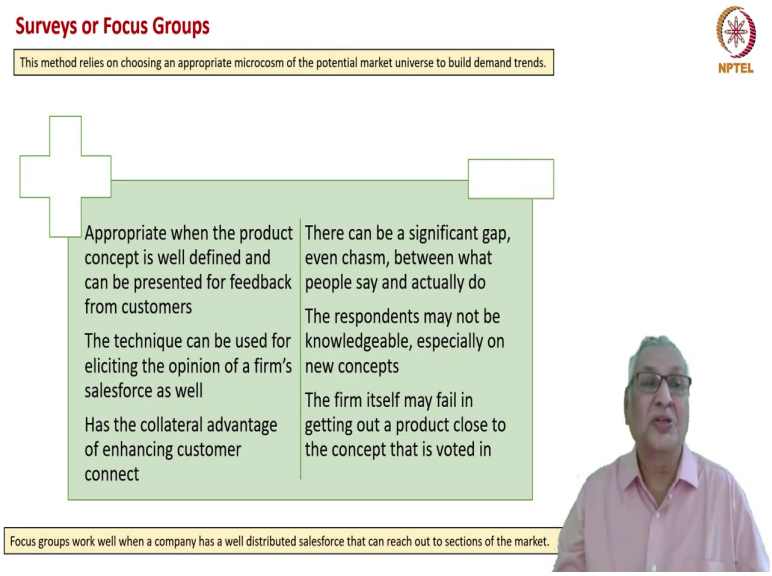

Then we have surveys or focus groups this method relies on choosing an appropriate microcosm of the potential market universe to build demand trends. Appropriate when the product concept is well defined and can be presented for feedback to customers. The technique can be used for eliciting the opinion of a firm's sales force as well.

Has the collateral advantage of enhancing customer connect. There can be a significant gap even chasm between what people say and what people actually do that is the negative other two negatives are the respondents may not be knowledgeable especially on new concepts.

The firm itself may fail in getting out a product close to the concept that is voted in, but these kinds of surveys or focus groups are extensively used by startups when they come up with disruptive products and they need some kind of specialist group to say whether these products are under a kind of hypothesis which can be validated by them.

Also, when the product is supported by a well distributed sales force who can reach out to the customers who actually use those products, it will be helpful to have this technique deployed.

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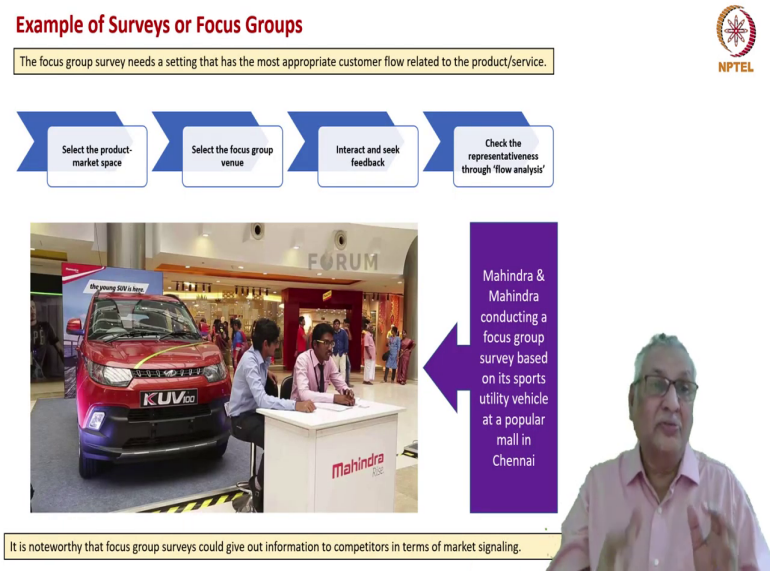

Given below is an example of surveys or focus groups. The focus group survey needs a setting that has the most appropriate customer flow related to the product or service you will recall that when I spoke about design thinking I talked about having a space where the design thinking activity can be conducted.

Therefore, you have to select the product market space you have to select the focus group venue interact and seek feedback and check the representativeness through flow analysis. In this case we have got a KUV 100 of Mahindra and Mahindra being displayed in a mall in Chennai and the executives of the company conducted the focus survey based on the customer interactions.

But what is to be noted here is that focus group surveys could give out information to competitors as well in terms of market signaling. So, its a very transparent process which can lead to results other than what have been envisaged. Analogy is another important method; it relies on gaining insights from similar products and services of the firm or its competitors.

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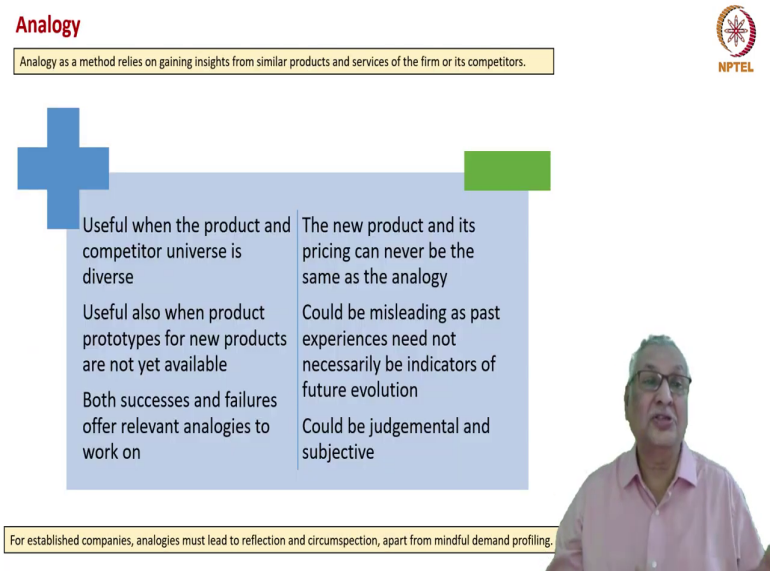

Analogy is very useful when the product and competitor universe is indeed diverse, it is also useful when product prototypes for new products are not yet available both successes and failures offer relevant analogies to work on the negative side any new product will not be exact clone of the previous product. In fact, it may generation ahead and it would have features that have never been there in the earlier product.

So, the analogy cannot exactly represent the future trend, it could be misleading as the consumers past experiences need not necessarily be indicators of future evolution and finally, it could be very judgmental and subjective. For established companies analogies must lead to reflection and circumspection apart from mindful demand profiling, it is something which is a very meditative style of demand forecasting.

The observations that come out of analogy cannot be just like that acceptance they have to be mulled upon, they have to be discussed and deliberated and an appropriate sustainable analogy established as a result of the thought process.

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There are several examples of analogy working out very well as predictors of market demand in a host of sectors. Music streaming, Apple had Napster which worked earlier Spotify had apple as a result music streaming was the perfect example of analogy. Sleeper buses first we had the aircraft seats which provided comfortable sleeping posture even in the sitting space.

Then we had the railway sleepers therefore, sleeper buses had these analogies to work on. Autonomous mobility we had guided transport even in the factory floors, we had fly by wire

aircraft and this has given the impetus to autonomous mobility as being a sustainable product.

In the foods and beverages space we had products of different flavour and products of different recipe, but the way the consumers responded to those different flavours and recipes gives confidence to the buried company that more such products can be utilized a classic example is Denon.

It experimented with Greek Yogurt in the beginning then it started mixing different kinds of fruits and nutritious ingredients. The kind of good response the products got encouraged the company to keep on coming up with the newer variants and what has been achieved by Denon has been seen by others as an analogy for their own activities.

Then we had COVID pill acceptance, Tamiflu was for influenza and there have also been other oral anti retrovirals. Although in this case analogy has been supported by scientific evaluation, but given also that the scientific evaluation has not been 100 percent complete or correct.

Analogy has been used by the doctors in prescribing these as somewhat off level recommendations, then we have from Ashok Leyland an LCV called Bada Dost. It has been developed based on the way its earlier LCV called dost took off and dost took off very well they thought that a L Bada Dost also will be taking off very well and the company also had the analogy of Tata Ace.

If Tata Ace could create a huge product stream and product space for Tata motors the company thought why will not dost and Bada dost create for the company. So, conceptual analogy is useful in estimating the demand profile for a new product that could make a similar thematic impact; however, launches may not always be accompanied by analogical specs and service conditions limiting the applicability of analogy as a tool for demand projection, it is very useful adjunct.

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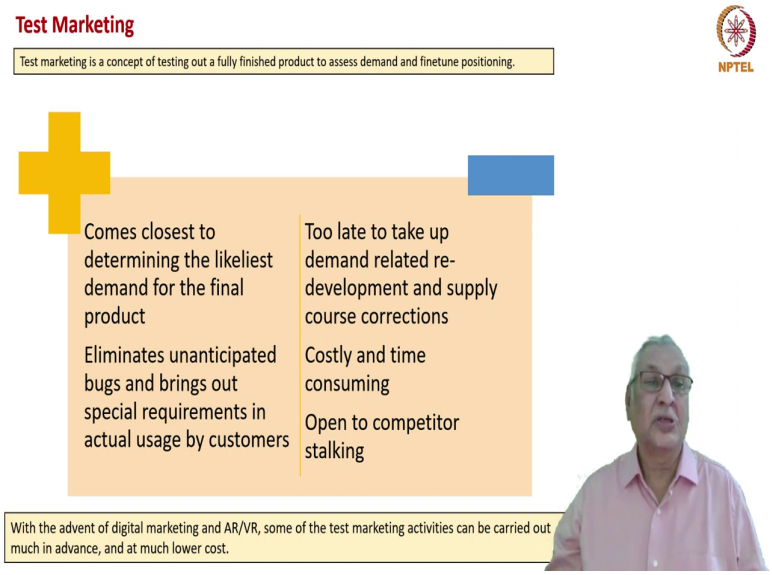

Then we have a concept called test marketing test marketing is a concept of testing out a fully finished product to assess demand and finetune positioning. It comes the closest to determining the likeliest demand for the final product because the product that is going to be offered is available in full form, style and performance considerations.

It eliminates unanticipated bugs and brings out special requirements in actual usage by customers. Test marketing goes one step further to demand estimation it is not just demand estimation or the satisfaction levels of the customers with reference to the product, it also brings out any mistakes or any bugs that are resident in the product and helps the company to fine tune the product to meet the requirements or at least eliminate the most important bugs.

But the negatives are. So, what it is too late to take up demand related redevelopment and supply course corrections test marketing may come up with a host of suggestions or

observations, but that is not going to be any solace for the company because the company has already rolled out an entire product launch plan and it is costly and time consuming and is open to competitors stalking and competitors developing certain anti postures on the product with the advent of digital marketing and ARVR.

Some of the test marketing activities can be carried out much in advance and at much lower cost and this is the advantage of test marketing in this new digital world.

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What are the examples of test marketing? From floor shift to paddle shift that is the car instead of having the gear shift at the floor level could have the paddle shift at the steering wheel level.

And this has been test marketed and companies have found out the best way to do that. From straw punch to flexi spout pouch that has been another example of test marketing, from bottle shampoo to sachet shampoo that has been an example of test marketing.

The SpaceX Civilian Flight itself is test marketing of a concept that is going to be commercial very soon. From vial and syringe to pre filled syringe has been test marketed and found acceptable to the patients as well as the doctors, from bottle spirit to alcohol swabs again has been test marked and found acceptable.

An FMCG company desiring to switch over to stand up pouches from pillow pouches that is pillow pouches are those ones which are flexible even after filling of the product and therefore, they lie horizontally. On the other hand, stand up pouches are pouches which have certain rigidity, so that they can stand up on this shelf space.

And typically, stand-up pouches have a cap through which the product can be flowed out, it could be for the detergent liquid, it could be for the edible oil and things which are fluidic in nature. And the disadvantage if one may so say so of the standup pouches is that they would have higher costly impact on this consumers.

The pillow pouches can be packed, but it looks not so elegant and the price advantage may give also the commodity feel for the product the way it is displayed and if the packaging is really good a stand-up pouch really stands out whereas, the pillow pouch looks lost in the crowd that it is in and this needs to be test marketed.

And the only way you can do the test marketing and assessment of demand is by display of these products these two types of products and see how the consumer responds to the two types of the products.

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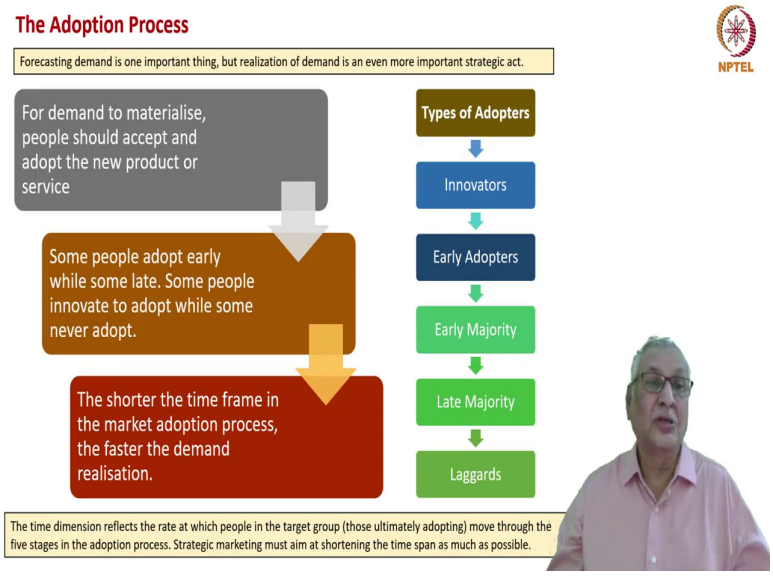

Then there is also an adoption process because demand could be there, but how the demand will be adopted in terms of the products that are available and what are the influences for that. For demand to materialize people should accept and adopt the new product or service. Some people adopt a product early on while some people adopt the product very late.

Some people are innovative we call them tech geeks for example, they adopt some new smart phones new smart variables; however, many people do not adopt so easily and some may never adopt as well. The shorter the time frame in the market adoption process the faster would be the demand realization.

So, there are several types of adopters which a company must be cognizant of such adopters could be innovators they could be early adopters they could be early majority of the customer

group there could be a late majority that could be happening later and there could be just laggards these all are types of adopters that could exist in the marketplace.

Companies have started realizing that there is a difference between demand being there, but and the demand getting adopted. So, companies have started putting on the retail floors people called promoters their job is to promote the product although a retail mall is open to every manufacturer and these are multi brand retail shops and everything is uniformly displayed.

It is left to the individual company to post a person who would explain the features of the product and why the demand perception the consumer has must be translated into actual purchase. So, the time dimension of the market adoption process is accelerated by having the promoters on the retail mall flow.

The time dimension reflects the rate at which people in the target group that is those people who are ultimately adapting move through these five stages in the adoption process. Innovators embrace the concept immediately, early adopters also take the product, but after little research on the product, early majority look at the people who are already embracing the product and then join into a kind of cluster of customers.

Late majority these are the skeptical people they are price conscious probably they want to understand what value is getting generated and then only they would take the product and finally, laggards they just are not interested in moving with the new stream. Strategic marketing or business development must aim at shortening the time span as much as possible. The shorter the adoption process the better it is to have the demand realized.

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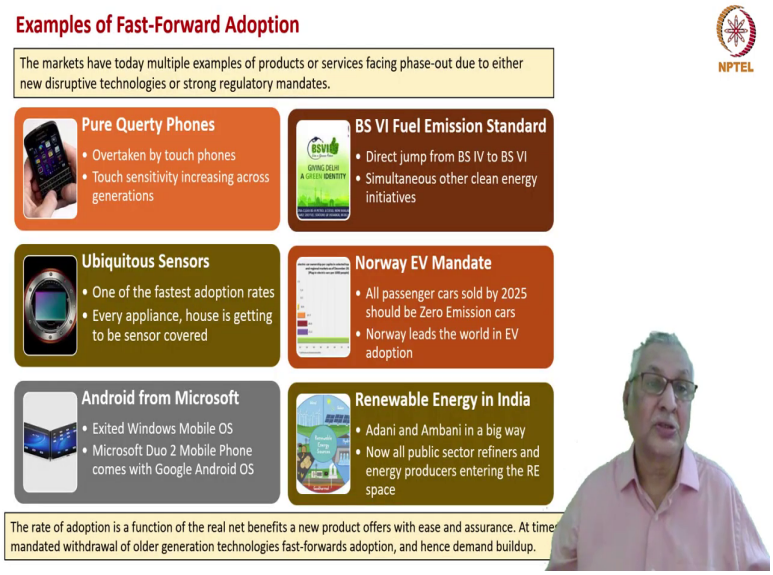

So, let us look at the fast forward adoption examples that we have. We are having today examples of products or services facing phase out due to either new disruptive technologies or strong regulatory mandates. In fact, there is some kind of belief in the leading Smartphone makers that the average life of a Smartphone in the hands of the millennial generation is only 8 months.

After 8 months another phone which has been launched will be taken up with eagerness and that would be having another life which means that there is an inbuilt bias in the marketplace towards technology, towards change and towards the lifestyle display that comes out of possessing a new generation of devices.

So, let us look at some of the examples, we had blackberry type of pure querty phones they were overtaken by touch phones and touch sensitivity began increasing across the generations

that is one example. We had ubiquitous sensors and sensors have had the fastest adoption rates amongst any industrial or electronic product every appliance in the house is getting to be sensor covered and the house itself is getting sensor covered that is the fastest adoption that has taken place.

This adoption at the first level has occurred at the industry level or at the design level people started appreciating the importance of internet of things the sensor environment and developing products which had that kind of ubiquitous capability, but once the products became available customers started adopting this kind of sensory mechanism.

Similarly, android from Microsoft it exited windows mobile OS after several years of experimentation with Nokia. Microsoft Duo 2 mobile phone came with Google Android OS it is an adoption of a technology that is different, but whether the customers have adopted the dual type foldable phone from Microsoft is still a question mark.

The adoption by the customers of the Samsung fold is far higher than the adoption by the customers of the Microsoft Duo 2. Microsoft's previous track record with the hardware could have been one factor or the reluctance of Microsoft to aggressively advertise it waiting for any other inputs coming from the actual usage could be the other factor, but this is one example of adoption intended to be fast forward is not getting fast forwarded as much as it should be.

Then we have BS VI fuel emission standard, the government of India has said that there should be a direct jump BS IV emission standards to BS VI emission standards and it was simultaneous with other clean energy initiatives as well. So, it is a leap into the future of technology and there is no two ways about it and it is legally mandated. So, it was a fast forward adoption.

But looking at the way these clean energy initiatives have been coming up other companies have been getting into the allied businesses there have been biodiesel manufacturers who

have come into the play. Companies which are in the edible oil industry started using the edible oil basis for developing the biodiesel product lines.

And sugar mills have ramped up their ethanol manufacturing capability and the oil companies themselves are putting up stand alone ethanol manufacturing refineries. So, this is one example of fast forward adoption in one line having a ripple effect across the product lines.

Then we have the Norway EV Mandate, it says that all passenger cars sold by 2025 should be 0 emission cars and Norway leads the world in EV adoption this is a mandate which has been eagerly adopted by the country and its citizens. Then there is the renewable energy in India.

It has been a concept brought forward by one or two companies and also supported by the government of India, Adani and Ambani have led the way more particularly Adani. Now all public sector refiners and energy producers are entering the renewable energy space.

So, people are adopting this kind of technological platform and this kind of market change that is going to occur. So, the rate of adoption is a function of the real net benefits a new product offers with ease and assurance this, adoption unless it is mandated will not happen automatically and will not occur in an accelerated fashion.

The rate of adoption will be a function of the tangible, experienceable, real net benefits that a new product offers with ease and assurance at times mandated withdrawal of older generation technologies may fast forward adoption and hence achieve demand buildup.

If there is a mandate that all the vehicles which are over 15 years of use or life shall be scrapped there would be a an adoption of the newer vehicles in a faster pace than would otherwise be possible. So, there are several dimensions to the fast forward adoption theory.

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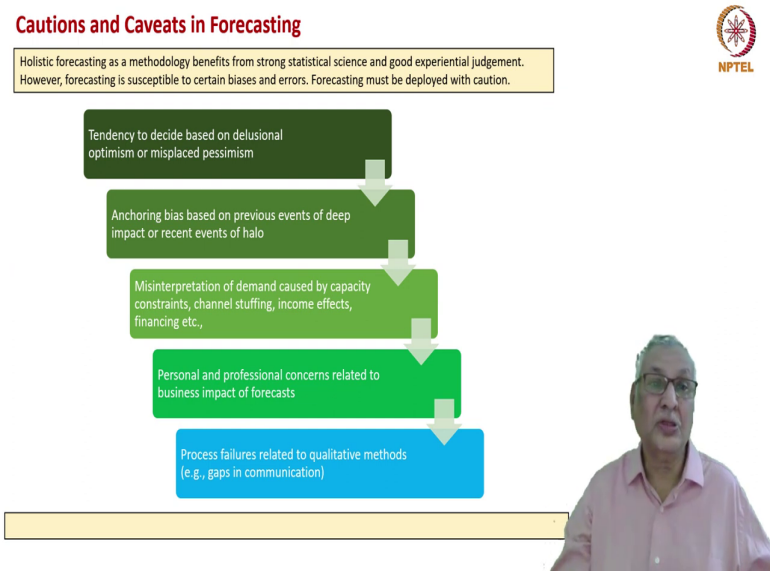

When we are doing this kind of forecasting, we need to be looking at some cautions and caveats. Holistic forecasting is a methodology that benefits from strong statistical science and good experiential judgment. However, forecasting is susceptible to certain biases and errors, forecasting must be deployed with caution.

There is a tendency to decide based on delusional optimism or exuberance or misplaced pessimism, when you look at a product or when you look at a product performing in the marketplace you get excited and when people get excited the company's representatives also get excited and they would feel that there is an optimism and that could be leading to wrong judgments of the demand situation.

Similarly, when a product is advertised or when a product is placed in the shelf there may not be immediate acceptance and that could lead to misplaced pessimism. Even in the movie

situation there are cases where the first day shows may not be adequately patronized, but the word of mouth would ensure that subsequent shows are well occupied.

So, there is a tendency which cannot be easily predicted therefore, there is a caveat related to this. Second anchoring bias always exist and this anchoring bias in the demand forecasting system and also on the part of the demand forecasters is based on the previous events of deep impact or recent events of halo.

Every demand forecaster would have either benefited from the demand forecasting exercise or deeply disappointed with the demand forecasting exercise that would provide some kind of exuberance or disappointment or caution in estimating the demand that is another thing that is human bias.

The third is the misinterpretation of demand caused by capacity constraints, channel stuffing, income effects, financing etcetera. We may say that the demand for passenger cars has (Refer Time: 38:00) in 2021 because of the economic situation, but probably the demand has not because of the economic situation, but because of the semiconductor shortages.

After Diwali people may expect high level of sales, but the sales could be just half of what has been achieved in the Diwali season that is not necessarily because of lack of demand in the post Diwali period for the product it is because this channel stuffing that has taken place if there is recession the income effects would have an impact in terms of the demand.

If the loan rates go up and therefore, the EMI rates or EMI levels go up there would be an impact on the real estate demand. So, these are all the ways in which certain other factors distort the demand and biases from actual demand estimation. Then there are personal and professional concerns related to business impact of forecast as well.

People believe that forecasts tie us down into a particular way of planning for the future. So, either you over invest or under invest and given that the demand forecasting process has so

many caveats which we have considered in the past slides as well as in this slide people tend to take it into account, but not completely rely on forecasting.

Then we also have process failures related to qualitative methods, we saw earlier that the quantitative models need not always be perfect there could be some erroneous assumptions built in or there could be wrong equation that has been developed.

In the qualitative methods there could be process failures that are related to qualitative methods that is gaps in communication. I have left the yellow rectangle free for you to think of any other cautions and caveats that could be arising in forecasting based on your experience as forecasters of demand in real life or in your professional life.

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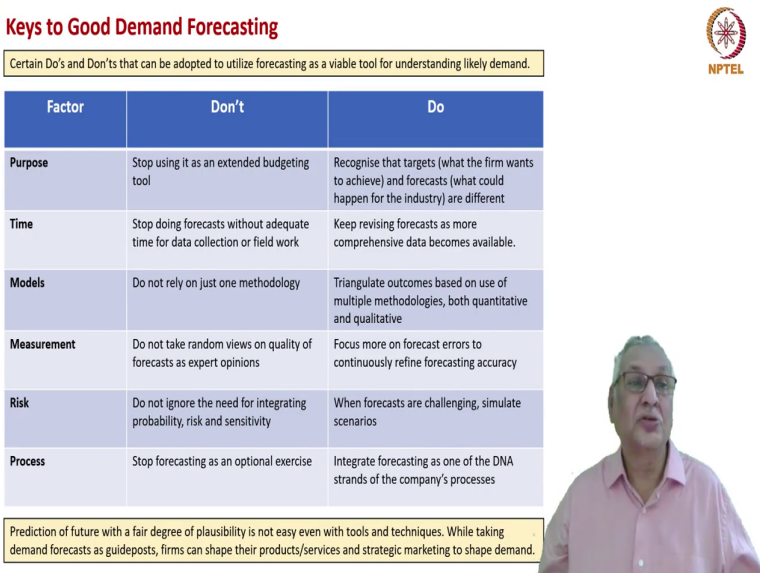

So, what are the keys to good demand forecasting? There are certain dos and donts that can be adopted to utilize forecasting as a viable tool for understanding the likely demand. First, we should understand the purpose we should not use demand forecasting as a onetime extended budgeting tool.

Many people wake up to the need for demand forecasting and the time for developing the budget for the next year comes up and after that it is just kept in the document that is not the way to look at the demand forecasting it has to be a dynamic exercise. Second, we have to recognize the targets what the firm wants to achieve and forecast that is what could happen for the industry.

And the firm are two different things, we have to be perspicacious enough to distinguish between these two targets versus forecasts. The second time we should not do forecast without adequate time for data collection or fieldwork, then you would be negotiating against yourself in arriving at a demand forecast.

What you need to do is to keep revising forecasts as more comprehensive data becomes available. Industry operates on a certain time principle you cannot keep on eternally waiting for things to happen, a company has to plan its future in good time. So, if the company has to take 2 months let the company take 2 months and then release the budget.

But as more data comes to the (Refer Time: 41:32) those must be used to keep revising the forecast and therefore, keep changing the strategy as well as the tactics. The third models do not rely on just one methodology we have seen several interesting methodologies that are relevant for demand forecasting.

Triangulate the outcomes based on the use of multiple methodologies both quantitative and qualitative the forecast must make sense in the context of the inputs which you get from the company's personnel from the competitors behavior and so on. Look at the measurement do not take random views on quality of forecast as expert opinions.

Do not think that any opinion expressed is the ultimate subject matter expert opinion it need not necessarily be so. You should focus more on forecast errors to continuously refine forecasting errors you have to look at that a forecasting process; however, machine driven or; however, machine dependent it is ultimately a human process. Therefore, there would be an inaccuracy that is there in the forecasting process.

So, your drive should not be to get just an as accurate a forecast as possible because it is a perfect scenario which you may not reach to what you should do is to keep on reduce the Arial levels in the forecasting, so that your accuracy gets enhanced.

So, you should understand how the assumptions are impacting in a not. So, correct way the forecast there is another thing which you need to keep in mind, then the risk we should not ignore the need for integrating probability of something happening the risk of happening are not happening and the sensitivity of the outcome to whatever are the other factors that would be impacting the demand.

And therefore, when forecast are challenging simulate scenarios there would not be one single forecast there would be many forecasts what happens if the geopolitical situation suddenly becomes very nice, what happens if the US fed stops increasing the rates, what happens if government announces stringent measures to rain in the fiscal deficit?

What happens if suddenly the banks decide that we need to inject far more liquidity into the system? So, these are all the factors which will require scenario planning rather than one singular demand forecasting. Then look at the process itself do not think of forecasting as an optional exercise, think of forecasting as one of the integral parts of the thinking of the company towards the future.

So, forecasting has to be one of the components of the DNA in fact, in fact it must be the key DNA strand of the company's process. So, prediction of future with a fair degree of plausibility is not easy that we must realize fundamentally it is tough it is complex even if you have tools and techniques.

Therefore while taking demand forecast as guidepost firms should shape their products and services and use strategic marketing to shape demand and the whole journal of demand forecasting which I have outlined here provides lot of perspectives as well as tools and techniques.

With all the pros and cons for you to choose the appropriate set of demand forecasting techniques and that would help you become a better business strategist as well as better business development professional. So, with this I come to the end of this lecture, I hope to see you in the next lecture.

Thank you very much.