UNIT 15 CONCEPT DEVELOPMENT AND TESTING

Objectives

After reading this unit you should be able to:

- discuss important concept generation methods
- explain concept evaluation
- define concept. testing and use the data for product decisions
- introduction to the product testing

Structure

15.1 INTRODUCTION

The new product development process consist of several steps like idea generation, concept generation and testing, product testing, pretest' market testing, test marketing, launching the new product and managing the product according to the product life cycle. At each stage of new product development, what we are trying to do is predict how many units of product or service offerings that the firm can sell. The high risk involved in the new product development and the number of failure stories of new product provide a reason for a better forecasting technique. One of the comprehensive methods of new product sales forecasting is elaborated in the subsequent section.

For Successful marketing of a product, it is imperative that the potential consumer should become aware of the existence of the new product, and the product should be available to them for adoption. If these two conditions are satisfied, the consuming unit, namely an individual, household, firm or an organization would try to use the product. Further, if the Produ^{c}t satisfy their need and expectations, they may continue to use the product, or repeat the purchase. Hence, for estimating the new product sales we may have to consider who are the buying units, what is their awareness level, Level of availability to them, then estimates of buying units trying the product and repeating the product consumption. This conceptualization of new product forecasting has been referred to as A.T.A.R. model' in the marketing literature (A: Awareness, T: Trial purchase, A: Availability, R: Repeat purchase). The definitions used in the model are presented in the Table 12,1.

Table 15.1
Definitions of Components of A.T.A.R. Model

- **Buying unit** :Individual, household, department, firm, organization.
- **Target Market** :[TM] Group of buying units to whom the marketing efforts are on. The buying unit may not be interested in the product at the i stage.
- **Current Market** : The group of buying units who are expected to buy the new product or other .close substitutds -hi the current time period.

- **Aware** : [Al The percentage of buying unit who learn about the new product existence, and perceive some differentiating characteristics of the product.
- **Available** : [D] If the buying units want to buy, the percentage chance they find the product. (Most often percentage of stores stocking the new product is used as a measure).
- **Trial:** :Actual purchase for the first time for consumption
- **Cumulative Trial Rate** : Percentage of buying units in the current product-market who have tried the product of the company at the end of the time period of t.

Ct is a function of awareness, availability, and concept performance.

$$C_t = TM_t * A_t * D_t$$

Repeat: At least one purchase after the trial purchase. Normally for consumer goods repurchase is considered as repeat and in case of durable goods at least one recommendation after the first purchase is considered as repeat consumption.

15.2 HOW TO GENERATE THE PARAMETERS FOR A.T.A.R MODEL?

Table 12.2 presents the sources of parameters for A.T.A.R model. It can be observed that the model ties up the entire product evaluation process. Several steps in the product development process can be used to find the parameters, the stage at which through understanding of the prospect of the product is noted as `best' in the Table 12.2. This would help in the resource allocation decision towards use of certain method or not for the estimation of the parameter.

Table 15.2
Sources of Parameters in A.T.A.R. Model

Parameter	Sources of Estimation				
	Market Research	Concept Test	Product Test	Component Test	Market Test
Buying units	Best	Helpful	———	Helpful	Helpful
Awareness	Helpful	Helpful	———	Best	Helpful
Trial	Best	Helpful	———	———	Helpful
Availability	Helpful	———	———	———	Best
Repeat	Best	———	———	Helpful	———
Consumption	Helpful	Helpful	Helpful	Helpful	Best
Price/unit	Helpful	Helpful	Helpful	Helpful	Best
Cost per unit	———	———	———	Helpful	Best

Notes: Best – best source of parameter in A.T.A.R. Helpful – Some knowledge obtained
Source: Adapted from Crawford (1997)

15.3 CONCEPT GENERATION

Concept generation is an innovative process; 'hence, organization should design structure and systems to unleash the creative potential• of the individuals in the organization: It is necessary to understand that being creative and innovative means not just novelty but essentially the innovation incorporating high degree of usefulness. We could find there are two kinds of creative profiles, one set of people more towards artistic creativity and the other set is more of scientific creativity. In product development context we need both of these creative capabilities within the organization. Another important characteristic that organization needs to nurture is that individuals should not only become innovators but also prolific. In the present context we shall look into the methods of concept generation only.

There are two major sets of concept generation mechanisms; viz. problem-based ideation and attribute based ideation.

Problem Based Ideation

The important step in this approach is to understand the needs and problems of ` stakeholders. This can be achieved by use of systematically analyzing the internal documents of the company, interviews of the stakeholder, from group discussions of the stakeholders and other market research. After identifying the problem it has to be analyzed s and answers have to be found to solve the problems. These answers would give rise to the new product concepts.

Problem Solving Methods

Once the problems are identified, we have to generate solutions. The problem solving can be attempted by individuals or in a group. There is common understanding that group effort results in more than individual creativity. Alex Osborn developed a methodology called brain storming, the main idea behind brainstorming is that the first individual presents an idea, second one reacts to these ideas, and third one continues with reacting to the earlier reaction. This process continues with out evaluation for several cycles. The presentation-reaction sequence is powerful mechanism in kindling creativity. This method has been accepted and used widely. However, in daily life this word has been abused by using for any speculative and arbitrary reactions. Two important principles that work behind brain storming are.

No evaluation during the idea generation: The evaluation of ideas and reactions are deferred to the end. The participants are encouraged to provide their ideas and .reactions freely with out inhibition. Evaluation would lead to criticism and impairs the free flaw of ideas.

Quantity of ideas would help in getting innovative solutions: The second principle is that the innovative and break through ideas can be obtained by increasing the quantity of idea during generation. The reason for the above is that the habitual thoughts dominate\ the structured and hierarchical thinking. The newer and "unconventional idea flows only later and to really obtain these ideas, the process has to be sustained for sufficiently longer time and increase the number of ideas. With these two principles in mind Crawford (1997) suggested four thumb rules for conducting brainstorming exercises.

1. Criticism of any form is ruled out, even very minute action like that of chuckles and raising eyebrows have to be necessarily restrained.
2. Participants are encouraged to shed their inhibition and free wheeling, wild ideas are welcomed.
3. Build on quantity to get innovative and break through ideas.
4. Pace has to be maintained throughout the process by building on previous ideas.
5. However, achieving all these in practice is difficult, and the leader should try to guide the group towards achieving large number of innovative ideas by more of persuasion than confrontation.

Attribute Based Ideation

Analytical attribute methods capitalize on. the fact that any change in the product is brought about by altering one or more current-product attributes. The method employs a forced change of all the possible attributes of the product and attempts to discover a totally innovative product. Some of the methods use the association of one attribute with others. Before getting on to the methods it is important to understand the meaning of attributes. In fact products are really a bundle of attributes. They can be classified in to three groups, namely features, functions, and benefits. Some examples of these attributes are presented in the Table 12.3. However the classification is not sacrosanct, it is mainly for convenience of presentation. There are several analytical attribute Methods for new product concept generation: They are; relationships analysis, dimensional analysis, gap analysis, analogy, benefit analysis and so on.

Table 15.3
Classification of Product Attributes

Product	Examples
1. Features	Product dimensions, esthetic features, price, materials, trade marks,
2. Benefits	Uses, economic gains, savings, feeling of well-being,
3. Functions	How the products work,

Relationship Analysis: One of the commonly used method of concept generation is relationship analysis, also referred to as morphological methods. In morphological analysis creativity is looked at as the process of combining seemingly disparate attributes or parts into a functional and useful product or service. Heuristic: ideation technique attributed to Tauber (1972) involves two stages;

- Identification of factors those are relevant that can be integrated in the new product,
- Generation of new product concepts by combining various factors and evaluation.

An example of this method for developing a new food product concept is presented in Table 12.4 .

Table 15.4.
Heuristic Ideation Technique

Food	Packages							
	Aerosal	Bag	Bottle	Box	Jar.	Can	Tube	-
Biscuits Bread Butter Cereal Salt Wafers								

Adapted from: Tauber E M (1972) HIT: Heuristic Ideation Technique, Jou of Marketing.

Morphological Forced Connection: In this approach more than two' dimensions are combined simultaneously. Table 12.5 presents an example of morphological method of new concept generation. Information about household cleaning products have been collected from the consumers. The survey specifically focused on' the following information;

- The cleaning equipment/ instruments! materials used
- Ingredients used in the cleaning process
- Objects to be cleaned
- Packaging or container of the cleaners
- The substances to be removed
- Forms and textures of the cleaners

Now the task of new product manager is to combine various benefits/ 'attributes/ features together to develop a product concept.

There are several equipments, ingredients, forms and textured materials and so on. It is possible to forcefully combine the dimensions to develop a new concept. Hundreds of concepts can be generated by combining one of the attributes of each dimension; 1, 2, 3, 4; 5 and 6. For example a "product concept may incorporate a brush with alcohol as the cleaning ingredient, specifically for cleaning food items in refrigerators, and in the form of liquid comes in paper pack". Once all the alternatives are generated the marketing manager can choose a few to develop them further and put them on concept testing.
Morphological methods are considered to be very powerful tool for generating new concepts. The methods are systematic, capable of generating very large number of alternatives, flexible, and relatively simple to implement. However, it is beyond the scope *of* this book to elaborate various methods of concept generation. With this discussion on concept generation we switch over to methods of concept testing

Table 15.5

Morphological Technique of new Concept Generation

Dimension 1 Equipment	Dimension 2 Ingredient	Dimension 3 Objects to be cleaned	Dimension 4 Package	Dimension 5 Substance to be removed	Dimension 6 Forms and texture
Broom	Water	Air	Aerosal	Mud	Cream
Brush	Alcohol	Glass	Bag	Grease	Powder
Damp mop	Ammonia	Floor	Bottle	Dust	Oils
Dry cloth	Acetone	Cabinets	Box	Food	Cakes
Dry mop	Pine oil	Carpets	Can	Dirt	Wax
Wet mop	Disinfectant	Curtains	Jar	Bugs	Solid
Hose	Phenyl	Combs	Paper pack	Blood	Gel
Rag	Petrol	Brush	Tube	Glue	Crystals
Sponge		Refrigerator		Strains	Gas
Vacuum		Leather			Liquid
Steel wool		Shoes			
Nylon wool		Jewels			

Adapted from: Crawford 1997.

Activity 1

Pick up any recently launched product of your choice or you are associated with and look into the various aspects of the concept generated.

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15.4 CONCEPT TESTING

Concept tests are of use in determining the following important issues in the new product development.

- Concept testing is a better method of generating the parameter for `trial' in the A.T.A.R. model. This is obtained by the percentage of buying units who will try the new product if they are made aware and the product is available.

  T, = TM * A, * D,

- In a new product development context, concept testing is helpful in estimating whether there is sufficient consumer acceptance. A positive consumer response would help in taking the product concept further for development and negative response would either lead to dropping the product altogether or reconsidering the product with necessary modification.

- Concept testing can be used for generating diagnostic information about the product idea and such a knowledge can be put to use in improving the product concept.

- New product may not appeal to all the consumers similarly, and hence concept testing can be used to identify the appropriate target markets.

- Concept testing also can be used to evaluate the changes and improvements of the existing products. In this case the focus will be on estimating the total sales that can be achieved by the modifications or developments in the product, what is the level of cannibalization, and impact of competitive products on the company products.

The process of concept testing includes, concept generation, evaluation of concept statements, data collection and analysis.

Activity 2

List out the benefits in testing a concept. How does this trap the marketer in the long term?

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Concept Statements

Concepts are in fact the new product ideas. And what-really put to test are the concept statements'. Consumers are responding to the entire set of stimuli, inclusive of the concept per se, the positioning, and the execution. The concept (statement) of a product/ service is a fair and good description may be stated verbally, presented pictorially (either still or motion picture) (refer Table 12.6). Basically it is a device used to communicate the product idea, and product offerings to the consumer for knowing their response. In practice several types of product concepts are used, it can be classified under few categories like factual and promotional (persuasive), and on the other hand it can he purely verbal, purely pictorial and combination of these two.

Table 15.6
Type of Product Concept Statements

		Tone	
		Factual	Persuasive
Mode	Verbal		
	Pictorial		
	Verbal & pictorial		

Normally the purchase intention increases favourably when the concept tone changes from factual to the persuasive tone. Similarly, the stimulus with both verbal and pictorial ones influence the purchase intention more than when they are used independently. Hence, adequate care has to be taken while interpreting the responses collected by using different methods.

In a consumer goods context a pictorial concept statement would be more appropriate to reflect the competitive situation. In case of -industrial goods context concepts statements are generally more factual and unbiased. Providing comparative product statements of the competing products would be more appropriate.

Apart from the selection of type of concept statement, it is important to write a good concept. A poorly written statement may lead to rejection of may be a good product idea, and reverse is also true. Concept tests can be refined using focus group interviews or with a series of personal interviews. Respondents can be shown a preliminary concept. statement and collect information on the following issues and refine the concept statement.

- Major benefits that are offered by the product concept
- whether the product benefits offered are important for the consumers?
- Is the offer made by the concept believable?
- Clarity of the statement and. exploring better ways of presenting the concept
- Advantages and disadvantages of the product concept
- Likelihood of consumer acceptance.

The concept statement and other associated stimuli are refined by iterative process based on the consumer feed back before the final data collection.

Test Design

Two types of test designs are used more commonly in the concept tests. First one is known as monadic and the other one is competitive tests.

Monadic Test: Only one concept is given as stimulus to the respondents for evaluation. When several concepts need evaluation, they are given to different matched sample respondents and compared subsequently across samples.

Competitive Tests: Two or more product concept stimuli are presented to the same respondent for evaluation.

There are advantages and disadvantages in using a particular type of test design. The favourable arguments for monadic tests are that several companies have used this method successfully, respondents evaluate the new concept in comparison to the existing product. The unfavourable factors of this method are, it is expensive because of the larger sample size. People advocate competitive tests mainly because this reflects the realistic market condition. Comparative tests are favourable for durable goods where the consumer go through an extended decision making process.

Data Collection

The next important step is collecting data from the respondents. Four kinds of data need to be collected from the respondents for an effective concept testing.

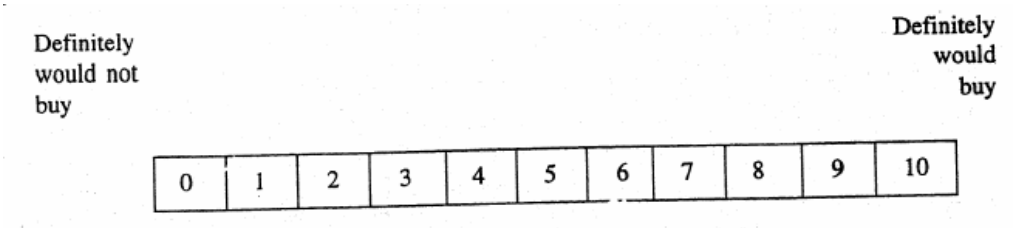
- purchase intention measure
- overall product diagnostic information
- product attribute diagnosis
- respondents profile information

Purchase intention is a good measure of trial in A.T.A.R model. The most commonly used purchase intention measures are direct measure of purchase intention, expected frequency of purchase, and probability of purchase. Purchase intention measures are included in almost all concept testing. A typical question would be posed as below for obtaining the purchase intention.

> Based on the product description presented to you, how likely would you be to purchase the product if it is available in the local store?

The five point scale is used widely, however other scales with six, nine or eleven' points are also used. A typical probability of purchase measure is presented as below

> *In the scale below please circle the number from zero to ten that best indicates the probability that you will buy the product. If you buy definitely indicate as `10' and if you definitely would not buy indicate `0'*



How to Interpret Purchase Intention Data

The most important information generated in the concept testing is purchase intention. The most commonly used measure is top box score, this is the positive responses for definitely would buy. Some times sum of top two boxes are also used, in other cases weighted sum are used as a measure of trial rate for the new product. For example [he results obtained from a concept for new herbal cosmetic are as below.

Definitely would buy	13 %n
Probably would buy	40%
May or may not buy	25 %
Probably not buy	12%
Definitely would not buy	10%

A typical question at this stage that should be answered is `what is a good or bad score?' What would be the volume of sales if the product is launched? Industry and product based norms are used as the bench mark for taking go/ no go decisions. Three sources of bench marks are in vogue, they are published articles, company records, and market research company experience.

Frequency of Purchase Measures

Purchase intention would give only the estimate of trial. For consumer goods, it is necessary to collect information on the frequency of purchase also, for estimating the volume of probable sales. Expected purchase frequency is used to generate this information. The frequently used purchase frequency measure is presented below.

Please indicate, which statement best describe how often you would buy the product if it is available in the local store

Once a week or more often	☐
Once every two weeks	☐
Once a month	☐
Once every two or three months	☐
Once every four or six months	☐
Once in a year	☐
Less often	☐
Never	☐

Overall Product Diagnostic Measures

For fine tuning the product to suit the consumer requirements, the managers need additional information about the product preferences. Normally a set of measures like, uniqueness of the products, believability, importance of the product in solving the consumer problem; inherent interest, value for money, relevance, main idea of the concept are collected from the consumers for diagnostic purposes.

Indicate the box that best describe how unique the product concept is in the product category

Very unique	Some what unique	Slightly unique	Nothing unique

Believability can be measured by open ended questions like, `what aspects of the product presented to you are hard to believe'?

Product Attribute Diagnostic measures

Products are made up of bundle of attributes. Consumers attach different importance and perceptions to these attributes. Some attributes may more favourably influence, and others may adversely influence the decisions of the consumer. Product development manager would be interested in identifying the importance that consumers attach for an attribute and try to improve the product by modifying the product attributes. Hence, most of the concept tests include a set of questions to evaluate the importance and perceptions of product attributes. For example, a scale for importance and perception for a new brand of shoe would be as follows.

Please indicate the importance you attach for each of the following attributes while purchasing a pair of shoes

Attribute of a shoe	**Not at all Important**				**Very Important**
Weight of the shoes	1	2	3	4	5
Representative social status	1	2	3	4	5
Comfort while wearing	1	2	3	4	5
Material of the shoes	1	2	3	4	5
Appearance of the shoes	1	2	3	4	5
Durability of the shoes	1	2	3	4	5
Price of the shoes	1	2	3	4	5

Please indicate the importance you attach for each of the following attributes while purchasing a pair of shoes

Attribute of a shoe							
Weight of the shoes	Heavy	1	2	3	4	5	Light
Representative social status	Low class	1	2	3	4	5	High class
Comfort while wearing	Uncomfortable	1	2	3	4	5	Uncomfortable
Material of the shoes	Natural leather	1	2	3	4	5	Synthetic
Appearance of the shoe	Formal	1	2	3	4	5	Flashy

Respondents Classificatory Measures

All the consumers may not consume the product in a similar way, they would differ based on the need for the product, importance of the product in meeting the needs, income and so on. A data collection procedure in. a concept test would include a set of questions to glean the consumer demographics, socio-economic status, current purchase behaviour, etc. These variable would be of use to the product development manager in identifying and characterizing the consumer segment' and identify the target segments.

15.5 DATA ANALYSIS FOR CONCEPT TESTING

We have learnt earlier that there are three main objectives of concept testing; (i) whether the product concept as it is evoking interest or needs to be modified,. (ii) how to improve the product concept if it is not creating enough appeal and (iii) segmentation and targeting of consumer for effective marketing planning. The data collected in the concept testing would be of use for achieving above objectives. The simplest and important analysis is constructing frequency tables. It can be constructed by counting how many respondents answered a question with a certain response. For example, the analysis of purchase intention could be, how many people have responded for `definitely would buy', how many people responded for `likely to buy', and so on.

The second and very commonly used analysis is cross tabulation. This is done with an idea to find out how consumers responded to two questions together in a certain way. For example, how many people responded that definitely they would buy as well as the income level is above ten thousand a month.

Statistical methods like correlation and regression are also used to understand the relationship between various variables studied in the concept testing.

Bench Marks: What level of purchase intention is acceptable and which is not acceptable is a typical question that the decision-maker has to answer. For example, what percentage of top box score in PI scale is acceptable score. Benchmarks are necessary for this purpose; they are also referred to as inormsi. Normally, companies assemble data from various concept tests and build a database. The top box responses obtained in the successful products can be as good indicator of `norms'. Some of the top box score suggested in literature, for example, detergents 12 per cent, fragrances with prices 18 per cent, food 20 per cent, and cleaning products 28 per cent Schwartz (1987). Adequate caution is necessary because for some times the norms can be misleading for example, a product can be very successful based on very loyal consumer and not because of very high top box score. In a simple new product predication model the top box score would be the predicator of tried. However, the score has to be adjusted for level of awareness and availability, i.e., among the people responded definitely would buy, all of them. may not be accessed by the company. Hence, the trial rate is determined by the above three factors.

CTR_L = top box score * $Advt_{t,}$ * Availability

As mentioned earlier CTR_t is the proportion of that people who tried the product in time period `t'. It was found that the PI is good predictor of new product sales.

Activity 3

List out the benefits in testing a concept. How does this help the marketer in the long run?

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15.6 SUMMARY

In this unit the A.T.A.R paradigm for new product forecasting has been introduced, and the ways and means for generating the parameters like concept testing and product testing are also presented. The second step is to generate innovative product concepts. There are two principal methods namely, problem based ideation and attribute based ideation. The commonly used problem based ideation is brain storming and attribute based ideation is morphological methods.

The concept statements are also of different kinds depending up of the tone and content; - they may be factual or persuasive concept statements. Invariably the response to persuasive statements will be more than the factual concept statements. Hence, adequate care has to be given while developing as well as in the analysis stage of concept testing. The main objective of Concept testing is to generate the parameter for trial rates in A.T.A.R. model. Along with this information about product diagnostics and segmenting variables also collected for targeting and positioning. Product testing is carried out to verify whether the product is in fact delivering the promises made in the concept. In A.T.A.R. model, product testing provides parameter for repeat rate. As in the case of concept testing, during product testing also the information on product diagnostics and segmenting variable are collected to evaluate the product acceptance and segmenting and targeting.

15.7 SELF-ASSESSMENT QUESTIONS

1). Discuss the major concept generation methods that you are familiar with.

2). Discuss the A.T.A.R. model for new product forecasting.

3). Analyse the complications of concept generation in terms of market acceptance of the product.

15.8 FURTHER READINGS

Wind Y J, Product Policy: Concepts, Methods and Strategy, Addison-Wesley Pub Co. London 1982.

Crawford M C, New Products Management, Irwin, Chicago 1997.

Moore W L and Pessemier E A, Product Planning and Management: Designing and Delivering Value, McGraw-Hill, Inc. New Delhi 1993.