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Markov chain model in measure brand switching of bath soap

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Abstract

This paper aims to explore the brand switching of bath soap one brand to other brands made by the purchasers especially G.M university students. Subsequently, analysed the various considerations of G.M university students while choosing and deciding to switch to another brands. The study also explains the market share of bath soap brands in present and future and descriptive analysis by presenting the result of information from G.M University as consumers of various brands of bath soap. All the calculations done by primary data and using this data probability matrix has been designed.

Keywords: - Brand, Switching, Bath soap, Consumer.

Introduction

Products and its brand need to be such that can surpass the competition. The reason is the creative way of promoting products with the help of technology by all companies. The market will become competitive and populated comparatively. It seems that the brand competition is even spreading fear in the market due to some negligence in maintaining the brand. The advancement of technology now plays a vital role in marketing or advertising the products. Almost all kinds of advertisement or promotion are in the realms of technology. The modern way of promoting products with the help of technology creates lot of opportunities for those who are ready to buy the product. In the end, there are only few Consumers Product¹ brands are chosen in one product category. For example, many consumers choose one of the brands in the market. There are so many factors which are responsible for the dissatisfaction of the consumer for a brand of products. The reason may come from the product itself and from the outside too. It is obvious that the product quality and the features of the product are quite dissimilar with the things presented in the promotion. This is termed as “over promise under deliver”. Basically, a brand makes the consumer to expect high when the product is promoted. But the brand of the product should be carefully promoted as it is risk for the brand when it is not fulfilling the consumer’s expectation. if the promotion of the product is reasonable, fulfilling the consumer’s expectation then it will compel the consumers to use the product again and again without any complain. So, the company should be aware not to take risk when promoting the products and not to make the exaggeration of the product.

Consumers prefer the best product with reasonable price. The unavailability of such product causes dissatisfaction to the consumer and then he tries to choose another brand. Another cause of dissatisfying consumer is that the brand come from the external factors. And few causes also come from the outside that brand of product that makes consumers dissatisfied.

There are also some factors that compels the consumer to prefer a certain kind of product brand than other brands. Firstly, the consumers prefer a particular product because the neighbours or relatives are using the same product or brand. Here the consumer gets influenced by those who lives around him to choose that particular brand. Here, the customer looks for the referral from others whom he knows well. Secondly, the reason for choosing the particular brand may be because of the consumer's loyalty for the brand.

Since the last century there have been marked changes in the approach to scientific enquiries. There has been greater realization that probability (or non-deterministic) models are more realistic than deterministic models in many situations. Observation taken at different time points rather than those taken at a fixed period of time began to engage the attention of probabilities. This led to a new concept of indeterminism: indeterminism in dynamic studies. This has been called "dynamic indeterminism". The period of dynamic indeterminism began roughly with the work of Mendel (1822-1884). The physicists (see Chandrasekhar, 1943) played a leading role in the development of dynamic indeterminism. Many a phenomenon occurring in the physical and life sciences are studied now not only as a random phenomenon but also as one changing with time or space. Similar considerations are also made in other areas, such as, social sciences, engineering and management and so on. The scope of application of random variables which are functions of time or space or both has been on the increase.

Objectives of Study

- To determine the stochastic matrix or transition probability matrix containing the different bath soap brands.
- To predict the market share of bath soap brands in present and future time by using descriptive analysis with the help of the information from the students of G.M University as consumers of various brand of bath soap.

Research Methodology

The total number of 242 sample of customers who are using bath soap has been taken from the students of Gangadhar Meher University, Sambalpur, Odisha to conduct the current research. The purposive sampling techniques have been applied for the research. All the 242 customers are given with a set of questionnaires by Google form through online to collect the primary data directly from them. So, the data that has been collected for this research is purely based on primary data or first-hand data. The questionnaire is intended to get the following information from the students. The brand of bath soap that they are presently using as well as they use to use in past. The data that is collected from the student's response are subjected to the Markov chain application and steady state equation. And the study predicts the possibility of buying same brand of products of bath soap or possibility of changing one brand to other brand of bath soap.

Markov chain

The stochastic process $\{X_n, n=0,1,2,\dots\}$ is called a markov, chain, if i or $j, k, j_1, \dots, j_{n-1} \in N$ (or any subset of I),

$$\begin{aligned} \Pr\{X_n=k|X_{n-1}=j, X_{n-2}=j_1, \dots, X_0=j_{n-1}\} \\ = \Pr\{X_n=k | X_{n-1} = j\} = p_{jk}(\text{say}) \end{aligned}$$

Whenever the first member is defined.

The outcomes are called the states of the markov chain; if X_n has the outcome j (i.e., $X_n = j$), the process is said to be at state j at n^{th} trial. To a pair of states (j,k) at the two successive trials (say, n^{th} and $(n+1)^{\text{th}}$ trials) there is an associated conditional probability p_{jk} . It is the probability of transition from the state j at n^{th} trial to the state k at $(n+1)^{\text{th}}$ trial. The transition probabilities p_{ij} are basic to the study of structure of the markov chain.

The transition probability may or may not be independent of n . If the transition probability p_{jk} is independent of n , the Markov chain is said to be homogeneous (or to have stationary transition probabilities). If it is dependent on n , the chain is said to be non-homogeneous. Here we shall confine to homogeneous chains. The transition probability p_{jk} refers to the states (j,k) at two successive trials (say, n^{th} and $(n+1)^{\text{th}}$ trial); the transition is one-step and p_{jk} is called one-step (or unit step) transition probability. In the more general case, we are concerned with the pair of states (j,k) at two non – successive trials, say, state j at the n^{th} trial and state k at the $(n+k)^{\text{th}}$ trial. The corresponding transition probability is then called m -step transition probability and is denoted by $p_{jk}^{(m)}$, i.e.

$$P_{jk}^{(m)} = \Pr\{X_{n+m} = k | X_n = j\}.$$

Transition Matrix:

Then transition probabilities p_{jk} satisfy

$$P_{jk}^{(m)} \geq 0, \quad \sum_k p_{jk} = 1 \text{ for all } j$$

These probabilities may be written in the matrix form

$$P = \begin{bmatrix} p_{11} & p_{12} & p_{13} & \dots \\ p_{21} & p_{22} & p_{23} & \dots \\ \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots \end{bmatrix}$$

This is called the transition probability matrix or matrix of transition probabilities (t.p.m) of the Markov chain. P is a stochastic matrix i.e. a square matrix with non-negative elements and unit row sums.

Definitions and Operational variables

Markov chain theory is a way to study the different properties of variable that shows the future expectation of variable the help of past and present evidence. Brand switching is customers' habit of changing brand from one product to another for any specific cause. Market share is explained as part of a market that run by a company, or a company's sales percentage of the total sales compared to the outstanding competitors with a particular time and place.

Data analysis method

According to the Muhammad Dharma Tuah Putra Nasution, Nashrudin Setiawan, Yossie Rossanty and Irawan, Solly Aryza Lubis (2019) purposed that data analysis is to explain the pattern of brand switching of bath soap from one brand to another made by G.M University students. It is analyzed descriptively by making pattern switch of the brand from one brand of bath soap to other bath soap brand. As for the magnitude of transition opportunities analyzed by using the equation:

$$P_{jk} = \frac{n_{jk}(t)}{n_j(t)}, \text{ where:}$$

$$P_{jk} = \text{transition probability (switch from brand } j \text{ to brand } k)$$

$$n_{jk}(t) = \text{number of bath soap brand consumers who move from brand } j \text{ to brand } k \text{ in time } t$$

$n_j(t)$ = number of brand bath soap consumers j at the beginning
of period t

Data analysis is to analysed what the students of G.M University consider in choosing and switching the bath soap brands that analysed descriptively. It is performed by tabulating the data or brand information of bath soap consumed by calculating the proportion. It is determined by the percentage comparison of the number of consumers of certain bath soap to the number of respondents obtained from the questionnaires that have been answered by the consumers. The objective is to analyze the market share of bath soap brands in the future that analyzed descriptive using the equation:

$MS(t) = MS(t-1) * P$, where

$MS(t)$ = Market share in period t

$MS(t-1)$ = Market share in the initial period

P = Transition probability

The above equation shows the calculation of market share prediction n the coming period by multiplying the initial market share with the transition opportunity (Siagian, 2006).

Result and Discussion:

Characteristics of G.M University students (customer) contain gender, stream, age and monthly expenditure. The following table explain the % of frequency with respect to some of these variables.

Table 2.1

Description	Amount	Frequency (%)
GENDER		
Male	134	55.4
Female	108	44.6
Other	0	0
Amount	242	100
STREAM		
Science	62	25.6
Arts	105	43.4
Commerce	75	31
Amount	242	100
AGE		
16-20	80	33
21-25	120	58.7
26-30	15	6.2
>30	5	2.1
Amount	242	100
MONTHLY EXPENDITURE		
< 1000	66	27.3
1001-2000	61	25.2
2001-3000	34	14
3001-4000	30	12.4
>4000	51	21.1
Amount	242	100

From the Table 2.1 it reveals that gender categories of the highest respondent is male (55.4%). The previous table describes the highest stream (education status) of respondents is Science (25.6%), Arts (43.4%) and Commerce (31.0%). The data explain that the most of respondents' lies between age range 21-25(43.4%), then age range 16-20 (33.0%). It can be seen that the most significant amount of G.M University students' monthly expenditure is in the range <1000 (27.3), then the range 1001-2000(25.2%). The data appear that the monthly expenditure of G.M University student is low.

Pattern of Redemption Brand of Bath Soap

The change of the brand by the purchaser will result in the pattern of switching the bath soap brands, so please know the data acquire of each purchaser of bath soap. Information on present and past purchasers' number are given below table2.2.

Table 2.2 Number of Purchasers Present and Past.

Brand	Past	New	Switch	Present
Dove	23	14	16	21
Dettol	32	22	20	34
Life buoy	37	14	24	27
Pears	14	6	12	8
Santoor	13	4	11	6
Mysore	10	15	4	21
Medimix	5	5	3	7
Cinthol	25	18	16	27
Patanjali	22	10	12	20
Himalaya	5	2	2	5
Flama	0	1	0	1
Vivel	7	6	4	9
Liril	4	3	4	3
Biotique	0	1	0	1
Wild stone	5	11	4	12
Specify	2	4	1	5
Lux	25	12	19	18
Other	13	11	7	17
TOTAL	242	159	159	242

In addition to purchasers who grow from other brands, the following are also presented purchasers who switch to other brands on several bath soap can be seen in the below table2.3.

Table 2.3 Purchaser who switch to other brands in different bath soap brands.

Brand	Dove	Dettol	life buoy	Pears	Santoor	Mysore	Medimix	Cinthol	Patanjali	Himalaya	Flama	Vivel	Liril	Biotique	Wild stone	Specify	Lux	Other
dove		3	1	3	0	1	0	1	0	0	0	0	1	0	0	0	3	3
dettol	2		5	1	0	1	0	6	2	0	0	0	0	0	1	1	1	0
life buoy	3	7		0	1	2	1	2	2	0	0	2	1	0	1	0	1	1
pears	1	0	0		0	3	2	1	1	1	0	0	0	0	0	0	3	0
santoor	1	1	1	0		1	0	2	0	1	0	2	0	0	0	1	1	0
mysore	0	1	0	0	0		0	0	1	0	0	0	0	0	2	0	0	0
medimix	0	0	0	0	0	0		1	0	0	1	0	0	0	1	0	0	0
cinthol	0	1	1	0	1	3	0		4	0	0	0	0	0	4	0	0	2
patanjali	2	1	0	0	0	3	0	0		0	0	1	0	0	1	0	1	3
himalaya	1	0	0	0	0	0	0	0	0		0	0	0	0	1	0	0	0
flama	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
vivel	1	2	1	0	0	0	0	0	0	0	0		0	0	0	0	0	0
liril	0	0	0	0	0	1	1	1	0	0	0	0		0	0	0	1	0
biotique	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
wild stone	1	0	0	0	0	0	0	2	0	0	0	0	0	1		0	0	0
specify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	1
lux	2	4	4	2	2	0	0	2	0	0	0	1	0	0	0	1		1
other	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	1	1	

Table 2.2 and 2.3 reveal a pattern of brand rearrangement of bath soap (brand changing pattern) conduct by purchasers. Brand changing pattern can be seen in the below table 2.4.

Table 2.4 Brand changing pattern.

Brand	Dove	Dettol	Life buoy	Pears	Santoor	Mysore	Medimix	Cinthol	Patanjali	Himalaya	Flama	Vivel	Liril	Biotique	Wild stone	Specify	Lux	Other	Past
Dove		7	3	1	3	0	1	0	1	0	0	0	1	0	0	0	3	3	23
Dettol	2		12	5	1	0	1	0	6	2	0	0	0	0	1	1	1	0	32
Life buoy	3	7		13	0	1	2	1	2	2	0	2	1	0	1	0	1	1	37
Pears	1	0	0		2	0	3	2	1	1	0	0	0	0	0	0	3	0	14
Santoor	1	1	1	0		2	1	0	2	0	1	0	2	0	0	1	1	0	13
Mysore	0	1	0	0	0		6	0	0	1	0	0	0	0	2	0	0	0	10
Medimix	0	0	0	0	0	0		2	1	0	1	0	0	0	1	0	0	0	5
Cinthol	0	1	1	0	1	3	0		9	4	0	0	0	0	4	0	0	2	25
Patanjali	2	1	0	0	0	3	0	0		10	0	1	0	0	1	0	1	3	22
Himalaya	1	0	0	0	0	0	0	0	0		3	0	0	0	1	0	0	0	5
Flama	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
Vivel	1	2	1	0	0	0	0	0	0	0	0		3	0	0	0	0	0	7
Liril	0	0	0	0	0	1	1	1	0	0	0	0		0	0	0	1	0	4
Biotique	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Wild stone	1	0	0	0	0	0	0	2	0	0	0	0	0	1		0	0	0	5
Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1	0	2
Lux	2	4	4	2	2	0	0	2	0	0	0	1	0	0	0	1		6	25
Other	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	1	1		13
Current	21	34	27	8	6	21	7	27	20	5	1	9	3	1	12	5	18	17	242

In the above table 2.4 the row of flama and the row of biotique reveal that consumers are not used flama and biotique bath soap earlier. But among the customers, one of medmix user is switching flama brand and one of wild stone user is switching biotique brand. These 2 switched data are adding other brand column on this row. Due to poor performance flama and biotique rows are neglected. Then new brand switching pattern can be seen the following table:

Table 2.5

Brand	Dove	Dettol	life buoy	Pears	Santoor	Mysore	Medimix	Cinthol	Patanjali	Himalaya	Vivel	Liril	Wild stone	Specify	Lux	Other	Past
Dove	7	3	1	3	0	1	0	1	0	0	0	1	0	0	3	3	23
Dettol	2	12	5	1	0	1	0	6	2	0	0	0	1	1	1	0	32
Life buoy	3	7	13	0	1	2	1	2	2	0	2	1	1	0	1	1	37
Pears	1	0	0	2	0	3	2	1	1	1	0	0	0	0	3	0	14
Santoor	1	1	1	0	2	1	0	2	0	1	2	0	0	1	1	0	13
Mysore	0	1	0	0	0	6	0	0	1	0	0	0	2	0	0	0	10
Medimix	0	0	0	0	0	0	2	1	0	0	0	0	1	0	0	1	5
Cinthol	0	1	1	0	1	3	0	9	4	0	0	0	4	0	0	2	25
Patanjali	2	1	0	0	0	3	0	0	10	0	1	0	1	0	1	3	22
Himalaya	1	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	5
Vivel	1	2	1	0	0	0	0	0	0	0	3	0	0	0	0	0	7
Liril	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	4
Wild stone	1	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1	5
Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Lux	2	4	4	2	2	0	0	2	0	0	1	0	0	1	6	1	25
Other	0	2	1	0	0	0	1	0	0	0	0	1	0	1	1	6	13
Current	21	34	27	8	6	21	7	27	20	5	9	3	12	5	18	19	242

Prediction of Market share of bath soap through Markov chain:

Markov chain is a method that analyses the properties of a variable in the current based on the past characteristic as an effort to estimate the properties of those variables in the future. In Markov chain study, the result is probabilistic in nature that can be used to help decision-making. This study is a descriptive technique but not an optimization technique in this context. The assumptions in the Markov chain involves to the transition probability state which is as follows:

- Each row sum of transition probability matrix is 1.
- The transition probability matrix does not change at the preliminary stage.
- The transition probability matrix depends only on the present state, not the period.

The calculation of transition probabilities shows in the below table:

Table 2.6

Brand	Dove	Dettol	Life buoy	Pears	Santoor	Mysore	Medimix	Cinthol	Patanjali	Himalaya	Vivel	Liril	Wild stone	Specify	Lux	Other
Dove	7/23	3/23	1/23	3/23	0	1/23	0	1/23	0	0	0	1/23	0	0	3/23	3/23
Dettol	1/16	3/8	5/32	1/32	0	1/32	0	3/16	1/16	0	0	0	1/32	1/32	1/32	0
Life buoy	3/37	7/37	13/37	0	1/37	2/37	1/37	2/37	2/37	0	2/37	1/37	1/37	0	1/37	1/37
Pears	1/14	0	0	1/7	0	3/14	1/7	1/14	1/14	1/14	0	0	0	0	3/14	0
Santoor	1/13	1/13	1/13	0	2/13	1/13	0	2/13	0	1/13	2/13	0	0	1/13	1/13	0
Mysore	0	1/10	0	0	0	3/5	0	0	1/10	0	0	0	1/5	0	0	0
Medimix	0	0	0	0	0	0	2/5	1/5	0	0	0	0	1/5	0	0	1/5
Cinthol	0	1/25	1/25	0	1/25	3/25	0	9/25	4/25	0	0	0	4/25	0	0	2/25
Patanjali	1/11	1/22	0	0	0	3/22	0	0	5/11	0	1/22	0	1/22	0	1/22	3/22
Himalaya	1/5	0	0	0	0	0	0	0	0	3/5	0	0	1/5	0	0	0
Vivel	1/7	2/7	1/7	0	0	0	0	0	0	0	3/7	0	0	0	0	0
Liril	0	0	0	0	0	1/4	1/4	1/4	0	0	0	0	0	0	1/4	0
Wild stone	1/5	0	0	0	0	0	0	2/5	0	0	0	0	1/5	0	0	1/5
Specify	0	0	0	0	0	0	0	0	0	0	0	0	0	1/2	0	1/2
Lux	2/25	4/25	4/25	2/25	2/25	0	0	2/25	0	0	1/25	0	0	1/25	6/25	1/25
Other	0	2/13	1/13	0	0	0	1/13	0	0	0	0	1/13	0	1/13	1/13	6/13
Market share	21/242	17/121	27/242	4/121	3/121	21/242	7/242	27/242	10/121	5/242	9/242	3/242	6/121	5/242	9/121	19/242

The initial transition probabilities comprise a transition probability matrix which is then indicated by P while the above Market share row have mentioned to as the prior market share symbolized by MS (0). MS (t-1) * P is to evaluate prediction of market share in the future period by multiplying market share in the first period with a transition probability matrix. From the above table2.6, it is recognize that MS (0) and transition probability matrix P are as follows:

$$\text{MS} \quad (0) \quad = \quad \left[\begin{array}{cccccccccccccccccccc} 21 & 17 & 27 & 4 & 3 & 21 & 7 & 27 & 10 & 5 & 9 & 3 & 6 & 5 & 9 & 19 \\ 242 & 121 & 242 & 121 & 121 & 242 & 242 & 242 & 121 & 242 & 242 & 242 & 121 & 242 & 121 & 242 \end{array} \right]$$

$$=[0.087 \ 0.14 \ 0.111 \ 0.033 \ 0.025 \ 0.087 \ 0.029 \ 0.111 \ 0.083 \ 0.021 \ 0.037 \ 0.012 \ .05 \ .021 \ 0.074 \ 0.079]$$

$$P = \left(\begin{array}{cccccccccccccccccccc} \frac{7}{23} & \frac{3}{23} & \frac{1}{23} & \frac{3}{23} & 0 & \frac{1}{23} & 0 & \frac{1}{23} & 0 & 0 & 0 & \frac{1}{23} & 0 & 0 & \frac{3}{23} & \frac{3}{23} \\ \frac{1}{16} & \frac{3}{8} & \frac{5}{32} & \frac{1}{32} & 0 & \frac{1}{32} & 0 & \frac{3}{16} & \frac{1}{16} & 0 & 0 & 0 & \frac{1}{32} & \frac{1}{32} & \frac{1}{32} & 0 \\ \frac{3}{37} & \frac{7}{37} & \frac{13}{37} & 0 & \frac{1}{37} & \frac{2}{37} & \frac{1}{37} & \frac{2}{37} & \frac{2}{37} & 0 & \frac{2}{37} & \frac{1}{37} & \frac{1}{37} & 0 & \frac{1}{37} & \frac{1}{37} \\ \frac{1}{14} & 0 & 0 & \frac{1}{7} & 0 & \frac{3}{14} & \frac{1}{7} & \frac{1}{14} & \frac{1}{14} & \frac{1}{14} & 0 & 0 & 0 & 0 & \frac{3}{14} & 0 \\ \frac{1}{13} & \frac{1}{13} & \frac{1}{13} & 0 & \frac{2}{13} & \frac{1}{13} & 0 & \frac{2}{13} & 0 & \frac{1}{13} & \frac{2}{13} & 0 & 0 & \frac{1}{13} & \frac{1}{13} & 0 \\ 0 & \frac{1}{10} & 0 & 0 & 0 & \frac{3}{5} & 0 & 0 & \frac{1}{10} & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \frac{2}{5} & \frac{1}{5} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & \frac{1}{5} \\ 0 & \frac{1}{25} & \frac{1}{25} & 0 & \frac{1}{25} & \frac{3}{25} & 0 & \frac{9}{25} & \frac{4}{25} & 0 & 0 & 0 & \frac{4}{25} & 0 & 0 & \frac{2}{25} \\ \frac{1}{11} & \frac{1}{22} & 0 & 0 & 0 & \frac{3}{22} & 0 & 0 & \frac{5}{11} & 0 & \frac{1}{22} & 0 & \frac{1}{22} & 0 & \frac{1}{22} & \frac{3}{22} \\ \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{5} & 0 & 0 & \frac{1}{5} & 0 & 0 \\ \frac{1}{7} & \frac{2}{7} & \frac{1}{7} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3}{7} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & \frac{1}{4} & \frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{4} & 0 \\ \frac{1}{5} & 0 & 0 & 0 & 0 & 0 & 0 & \frac{2}{5} & 0 & 0 & 0 & 0 & \frac{1}{5} & 0 & 0 & \frac{1}{5} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{1}{2} & 0 & \frac{1}{2} \\ \frac{2}{25} & \frac{4}{25} & \frac{4}{25} & \frac{2}{25} & \frac{2}{25} & 0 & 0 & \frac{2}{25} & 0 & 0 & \frac{1}{25} & 0 & 0 & \frac{1}{25} & \frac{6}{25} & \frac{1}{25} \\ 0 & \frac{2}{13} & \frac{1}{13} & 0 & 0 & 0 & \frac{1}{13} & 0 & 0 & 0 & 0 & \frac{1}{13} & 0 & \frac{1}{13} & \frac{1}{13} & \frac{6}{13} \end{array} \right)$$

The following value are the predicted market share of bath soap products in the first and second period.

$$\text{MS}(1) = \text{MS}(0) * P$$

$$=[0.081 \ 0.14 \ 0.095 \ .0026 \ 0.017 \ 0.1 \ 0.028 \ 0.12 \ 0.81 \ 0.016 \ 0.033 \ 0.013 \ 0.066 \ 0.026 \ 0.026 \ 0.058 \ 0.1]$$

$$\text{MS} (2) = \text{MS} (1) * P$$

$$= [0.078 \ 0.134 \ 0.086 \ 0.023 \ 0.015 \ 0.11 \ 0.029 \ 0.121 \ 0.082 \ 0.082 \ 0.013 \ 0.028 \ 0.014 \ 0.072 \ .028 \ 0.053 \ 0.114]$$

From the above evaluation, the prediction of market share for two periods on several of bath soap brands purchased by student in G.M University is determined. Prediction of market share in first, second and average periods for each bath soap brands have explained in below table.

Table 2.7 Prediction of market share

Brand	Current	Period 1	Period 2	Average
Dove	8.70%	8.10%	7.80%	8.20%
Dettol	14%	14%	13.40%	13.80%
Life buoy	11.10%	9.50%	8.60%	9.73%
Pears	3.30%	2.60%	2.30%	2.73%
Santoor	2.50%	1.70%	1.50%	1.90%
Mysore	8.70%	10%	11%	9.90%
Medimix	2.90%	2.80%	2.90%	2.87%
Cinthol	11.10%	12%	12.10%	11.73%
Patanjali	8.30%	8.10%	8.20%	8.20%
Himalaya	2.10%	1.60%	1.30%	1.67%
Vivel	3.70%	3.30%	2.80%	3.27%
Liril	1.20%	1.30%	1.40%	1.30%
Wild	5%	6.60%	7.20%	6.27%
Specify	2.10%	2.60%	2.80%	2.50%
Lux	7.40%	5.80%	5.30%	6.17%
Other	7.90%	10%	11.40%	9.77%
Total	100.00%	100.00%	100.00%	100.00%

Conclusion:

My study in this paper try to explore the pattern of switching to one brand of bath soap to other bath soap brands. Earlier customer use to prefer the brand of lifebuoy as a bathing soap due to its medical property for health. But new consumers are switching to Dettol from other brands. Because of its availability, quality and hygiene. The lowest percentage of consumer are choosing lilril bath soap. Only 1.20% of consumers use lilril. In next two period year market share of lifebuoy will be 8.60% while Dettol, lilril will be 13.40% and 1.40% respectively. Cinthol second highest brand after Dettol that attract consumer for it. Apart from these brands, the other brands market share is 9.77%. This study reveals that people are always interest to try new brands based on brand value, market value as well as its advertisement. The majority of the respondents bought soap from stores and some from luxury shops because of discounts and free bundled promotions. It may be suggested that more complimentary branded issues or discounts be introduced periodically to recall consumers of the brand. All customers who purchase various bath soaps are pleased with the quality of manufacturing, manufacture, and protection, as well as the numerous uses of bath soap. Consumers are more attentive of pricing and product qualities of the brand at the moment of purchase, as seen by the above facts. As a result, it is suggested that the product's skin protection properties be improved, while a strong emphasis be placed on improving the product's aroma, allowing businesses to acquire significant competitive advantage in the different beauty soap segments.

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