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MARKET SHARE ANALYSIS OF AQUA BRAND DRINKING WATER WITH *MARKOV CHAIN APPROACH* ON PT.X EMPLOYEES

Tri Vanti Devi Yulia ^a, M. Imron Mas'ud ^b

^{a, b} Industrial Engineering Study Program, Yudharta University Indonesia

Writer Related : triv_2002@rocketmail.com

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ABSTRACT

PT. Tirta Investama is a company that is involved in the bottled drinking water industry (AMDK). The success achieved by Aqua at that time was followed by the emergence of new players in the bottled water industry.

As a result, many brands of bottled water have emerged and competition between producers continues to develop, so companies need to periodically monitor the position of their products against their competitors' products in order to analyze the market share of their products and find out about market changes that occur using one of the Operation Research methods, the Markov Chain method. The purpose of this study is to predict consumer behavior to analyze market share and determine changes in market share through consumer behavior. The results of the Markov chain analysis show that Aqua's market share as the most popular brand turns out to be slowly increasing its market share, starting from 45% in 2020 and then in 2021 to 63.9%. Oasis's market share was originally 2% in 2020 and then increased to 2.9% in 2021. Le Minerale, which was originally 18% in 2020, increased to 19% in 2021.



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1. Introduction

The more his awareness public For life Healthy as well as want practical things, things the push Lots company drinking water processing (AMDK) has emerged, Chairman of the Indonesian Bottled Water Companies Association (Aspadin) (Aditya, 2019). There are changes in the business world, progress technology and level competition life is getting better tall For fulfil increasing needs diverse, causing the more the amount product consumption offered in the market for fulfil need consumer the.

(Supriatna) et al., 2018) which states that Regency Pasuruan own drinking water company in packaging (AMDK) the most in East Java with a total of 16 companies. Things This because of Regency Pasuruan sandwiched with Mount Arjuna and Mount Sulfur in the southwest and Mount Tengger, with the peak Mount Bromo in the part southeast. With existence Lots mountains This so automatic source enough spring water abundant in the district Pasuruan.

PT. Tirta Investama is one of company in motion in drinking water industry in packaging (AMDK). The success achieved by Aqua at the time That followed with emergence player new in drinking water industry in packaging (AMDK). As a result Lots drinking water brands in packaging

(AMDK) appears and arises competition between manufacturer . company need monitor in a way periodic position the product to product its competitors use analyze market share of its products and knowing market changes that occur .

A company can predict supporting market share with use one of the method *Operation Research* , namely method *Markov Chain* . tools analysis that can used For predict product market share For time certain in the future come along with pattern market changes that will occur happen .

a) Formulation Problem

1. How knowing the market share of drinking water products in packaging with use method chain Markov ?
2. How change market share of drinking water products through behavior consumer with use chain Markov ?

b) Objective

1. Knowing the market share of drinking water products with use method chain Markov .
2. Know change market share of drinking water products through behavior consumer with use chain Markov .

c) Benefit

1. For Academics

Development and Implementation science in the real world in the form of useful method in analyze market share and find out change market share through behavior consumer with use method *Markov Chain*

2. From the side Practitioner .

It is expected Can become alternative for company in finish problem company in compete in maintain and even capture the existing market .

2. Review Literature

Research conducted by (Arief et al ., 2017). With title research " influence trust brand and commitment brand to loyalty brand (survey on citizens) ward liability consumer Aqua products in the city Malang)". The purpose of study This is For know How influence trust brand and commitment brand together and individually to loyalty brand . Types of research in research This is *explanatory research* with approach which quantitative to use instrument study in the form of questionnaire distributed to 72 respondents who were residents of Penanggungan Subdistrict consumer Aqua products . Data processing is carried out with use SPSS 13.0 *software for Windows*. . Based on the results of the t-test, it was found that that variable commitment brand have the largest t - value and beta coefficient . So that variable commitment brand have the most powerful influence compared to with other variables so variable commitment brand have dominant influence to loyalty brand .

Keisa Az-zahra, AAPA Suryawan Wiranatha, and Luh Putu Wrasiasi . (2019), held study with title " Market Share Analysis of Several Product Brands " Fermented Milk Drink in Packaging with Markov Chain Method in the Environment Udayana University Campus ". Research This aiming For learn characteristics consumer product fermented milk drinks in the Udayana University environment as well as analyze market share in five years forward and determine balance long term market share long from each brand fermented milk drinks .. Primary data used in the form of questionnaire that has been tested and distributed to 100 respondents who were customers who know and consume fermented milk from the specified brand that is in the Udayana University environment . Data analysis conducted is analysis chain Markov (*Markov chain*) uses QM 5.3 *software* . Research show that Predicting market share at point equilibrium can using QM 5.3 for Windows software. Then we get point equilibrium interest from a number of fermented milk brand said in the year to 84 namely brand Calpico (7%) while Cimory (25.7%), Vitacharm (3.4%) also Yakult (60.6%) and other brands others (3.3%), point equilibrium that began in the year to 84 assumed happen Because study This carried out in the room small scope (Az-zahra et al . , tt).

Bottled Drinking Water

Water is source Power nature is important in support development economic and social like sector industry , power plant electricity , agriculture , fisheries , animal husbandry , transportation , tourism , and housing ladder . Bottled Drinking Water according to Department Trade and Industry in

revision of SNI 01-3553-2006, defined as water that has been processed, packed and safe For drunk directly. According to Regulation Minister of Industry of the Republic of Indonesia No.96/ M-IND/ PER/ 12/ 2011, drinking water in packaging is processed raw water in accordance with condition technical.

Markov Chain

Markov is A related techniques with probability will state in the future with analyze probability moment this (Carlucci et al., 2016). This technique own diverse application in the business world, including market share, prediction losses, and determine whether A machine will experience future damage. Another definition states that Markov Analysis is A method in analyze behavior moment This from a number of variable with objective For predict behavior from the same variable in the future.

Market share

Definition from market share or *market share* is part sale total industry of A companies in a particular market that is stated in form percentage moment This (Carlucci et al., 2016) If a market share of a company with product certain have market share of 30%, then can interpreted that If total sales of products similar in period certain is of 1000 units, then company the through the product will to obtain sale of 300 units.

Based on thoughts and formulations problem can be described framework draft thinking as following:

Phenomenon with emergence various different types of AMDK as well as the advantages of each product offered to consumer in frame to win competition, then:

1. know market share of drinking water products in packaging
2. How change market share of drinking water products through behavior consumers.
3. Spread questionnaire to employees at PT.X as respondents.
4. Use analysis chain Markov For know change market share through behavior consumers.

Markov Chain Method Approach

Knowing the market share of drinking water products with use method chain Markov. Know change market share of drinking water products through behavior consumer with use chain Markov

Data processing:

1. Analysis Markov Chain
2. Analysis using SPSS Program

3. Methodology

Research Location

As for the location study For obtain opinion data Respondent that is taking samples from PT.X employees in the Ngoro Mojokerto area of Java east.

Data source

1. Primary Data

Data is notes about facts, where facts That Alone is something that can caught by the five senses. Primary data is the most basic data sourced from research.

Primary data is special answer question research. In the research Here, primary data includes data from the results distribution questionnaire and interview with respondents. Data obtained straight from subject study with wearing tool measurement or tool direct data collection on subjects as source information sought. (Bachri, 2010).

Types of data used is primary data. Source of data obtained with spread questionnaire on PT.X employees in Ngoro Mojokerto Regency, East Java.

2. Secondary Data

Secondary data is research data sources obtained researcher in a way No direct through intermediary media (obtained and recorded by other parties). Secondary data generally in the form of evidence, record ril from or report historical that has been arranged in published and unpublished archives (documentary data) published (Siahaan, 2016)

Secondary data is the data collected in a way No direct from the source . In the research This , Secondary data is taken from results study or data results from people or institution certain published For general obtained through journals research . Secondary data collected through library , namely with method reading , studying , and journals research that suggests related problems with title study .

Data collection

Questionnaire

Most of the study generally use questionnaire as selected method For collect data. Questionnaire is tools / techniques For data collection carried out with method submit a set question or question written to Respondent For answered . Questionnaire or questionnaire of course have Lots kindness as a data collection instrument . Benefits/ uses questionnaire that is :

1. Help researcher in data collection about things to do asked to respondents .
2. Researcher Can in a way systematic and sequential in submit question .
3. Questions asked to Respondent can uniformized , so that the data obtained Can compared One The same other .

Questionnaire made with use question open , namely consists of from questions For explain identity respondents and questions closed , namely question that asks Respondent For choose one available answers from every questions . Answers given by respondents Then given score with scale certain . Sequence scale consists of from :

1. Strongly agree get score 5
2. Agree get score 4
3. I disagree get score 3
4. Don't agree get score 2
5. Absolutely not agree get score 1

4. Results and Discussion

Description Respondents

Taking technique sample used is *purposive sampling* , namely determination sample based on criteria certain , there are criteria election sample that is employees of PT. X located in Ngoro Mojokerto, East Java.

n = Sample

Markov Chain Analysis

market share of drinking water products in packaging

Markov processes have Lots applied in life everyday , for example For analyze about displacement brand (*brand switching*) in marketing , calculation account , planning sales , maintenance machines , queues . In the Markov analysis that is produced is a information probabilistic which can used For help making decision . The information generated No absolute become a decision , because its nature only give help in the process of taking decision . Consumer taste always changed in use a product so that cause existence displacement brand , which is common symptoms happening among consumers in general . For understand more clear about shift appetite or displacement consumer from One brand to brand other , following This will discussed about displacement brand drink tea Ready serving in

form packaging with use method analysis *Markov Chain* . In more Details pattern displacement brand mineral drink in form packaging shown in Table 4.12.

Brand Switching Patterns from One Brand to Another

From Brand	To Brand					
	Aqua	Oasis	The Mineral	Club	Other	Resp. Currently
Aqua	34	2	5	16	7	64
Oasis	3	0	0	0	0	3
The Mineral	5	0	10	4	0	19
Club	3	0	2	2	3	10
Other	0	0	1	0	3	4
Resp. Currently	45	2	18	22	13	100

Source : Research results (2020)

Table 4.1 Calculations Matrix Probability Transition

Brand					
	Aqua	Oasis	The Mineral	Club	Other
Aqua	$\frac{34}{45}=0.756$	$\frac{2}{2}=1$	$\frac{5}{18}=0.278$	$\frac{16}{22}=0.727$	$\frac{7}{13}=0.538$
Oasis	$\frac{3}{45}=0.067$	$\frac{0}{2}=0$	$\frac{0}{18}=0$	$\frac{0}{22}=0$	$\frac{0}{13}=0$
The Mineral	$\frac{5}{45}=0.111$	$\frac{0}{2}=0$	$\frac{10}{18}=0.556$	$\frac{4}{22}=0.182$	$\frac{0}{13}=0$
Club	$\frac{3}{45}=0.067$	$\frac{0}{2}=0$	$\frac{2}{18}=0.111$	$\frac{2}{22}=0.091$	$\frac{3}{13}=0.230$
Other	$\frac{0}{45}=0$	$\frac{0}{2}=0$	$\frac{1}{18}=0.056$	$\frac{0}{22}=0$	$\frac{3}{13}=0.230$

Source : Research results (2020)

Table 4.2 Probability Transition

From Brand	To Brand				
	Aqua	Oasis	The Mineral	Club	Other
Aqua	0.756	1	0.278	0.727	0.538
Oasis	0.067	0	0	0	0
The Mineral	0.111	0	0.556	0.182	0
Club	0.067	0	0.111	0.091	0.231

Other	0	0	0.056	0	0.231
Market Share	0.45	0.02	0.18	0.22	0.13

Source : Research results (2020)

From Table 4.12 we can see that Aqua's loyal customers are 75.5%, switching from Aqua to Oasis 1%, to *Le Minerale* 27.8% , to Club 72.7% and to brand other 53.8%. Oasis customers who switched to Aqua 6.6% loyal customers 0%. *Le Minerale* customers who moved to Aqua 11.1% , loyal customers 55.6%. Displaced Club customers to Aqua brand 6.6%, loyal customers 9.1%, and to other brands 23.1%. While the bottom row show current market share This For type drinking water brands in packaging .

Change Market Share of Drinking Water Products

For do prediction market share in the period to come come can counted with use formula: $X_n = X_0 P^n$ that is multiply matrix incident with matrix probability its transition (P). It is assumed matrix probability the transition nature constant and result calculation can seen following This :

A B C D E

$$0.7550,0660,1110,0660 \ 10000 \ 0.27800,5560,1110,056 \ 0.72700,1820,0910 \ 0.538000,2310,2310$$

$$0.6390,0290,1900,0990,040 = 0.6590,0420,1940,0810,019$$

Table 4.3 Predictions Proportion Consumption of Bottled Drinking Water

Brand	2020 %	2021 %	2022 %
Aqua	45%	63.9%	65.9%
Oasis	2%	2.9%	4.2%
The Mineral	18%	19%	19.4%
Club	22%	9.9%	8.1%
Other	13%	4%	1.9%

Source : Research results (2020)

prediction proportion drinking water consumption in packaging , where Aqua as most favorite brands it turns out share the market in a way slowly the more increased , which was originally in 2020 by 45% then 2021 to 63.9%. Oasis' market share was originally 2% in 2020 and then increase to 2.9% in 2021. The original *Le Minerale* 2020 increased by 18% to 19% in 2021. Club, which was originally 22%, has increased decrease to 9.9% in 2020. Meanwhile That brand others which were originally 13% down drastic to 4% in 2021 .

CONCLUSION AND SUGGESTIONS

Conclusion

Based on results study about analysis Aqua drinking water market share , then can withdrawn conclusion :

1. Characteristics Aqua consumers who become Respondent from type sex known is as many as 57 people or (57.0%) respondents study is men, while for the type sex woman as many as 43 people, left together family, and profession as employee private. Respondents get information regarding Aqua drinking water from advertisements on television, usually Respondent do Purchase of Aqua drinking water in shops / stalls, with an average consumption of Aqua drinking water of no determined, above initiative alone and not Once plan it moreover formerly.
2. Analysis results Markov chain shows that Aqua's loyal drinking water customers, Aqua's loyal customers are 75.5%, moving from Aqua to Oasis 1%, to Le *Minerale* 27.8%, to Club 72.7% and to brand other 53.8%. Oasis customers who switched to Aqua 6.6% loyal customers 0%. Le *Minerale* customers who moved to Aqua 11.1%, loyal customers 55.6%. Displaced Club customers to Aqua brand 6.6%, loyal customers 9.1%, and to other brands 23.1%.
3. Drinking water market share in packaging will reach condition stable in the long term length where share Aqua market as most favorite brands it turns out share the market in a way slowly the more increased, which was originally in 2020 by 45% then 2021 to 63.9%. Oasis' market share was originally 2% in 2020 and then increase to 2.9% in 2021. The original Le *Minerale* 2020 increased by 18% to 19% in 2021. Club, which was originally 22%, has increased decrease to 9.9% in 2020. Meanwhile That brand others which were originally 13% down drastic to 4% in 2021.

Suggestion

Remember Aqua drinking water products are in good condition stability upper market initiative themselves to consumers who have already loyal. Many new brand of drinking water in the market so that expected study This can developed with use object study others. And it is hoped For study furthermore in look for Respondent For more notice that consumers who become Respondent as required

ORIGINALITY STATEMENT

"I declare and am responsible answer with Actually that Article This is results work I Alone except excerpts and summaries of each of which have I explain the source"

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