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Analysis Of Television (Tv) Brand Switching Prediction In Xyz Msme Market Share Using Markov Chain

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Abstract

The rapid development of digital broadcasting technology and the implementation of the Analog Switch-Off (ASO) policy have intensified competition among television brands and increased the occurrence of brand switching behavior among consumers. This condition requires business owners to understand consumer switching patterns in order to anticipate market share changes and develop more effective marketing strategies. This study aims to analyze consumer switching patterns among television brands, predict future market share, and determine the long-term equilibrium condition (steady state) using the Markov Chain method. The research was conducted at UMKM XYZ using a quantitative approach with data collected from questionnaires distributed to 50 respondents over a 90-day observation period. The analysis involved constructing a transition probability matrix, determining the initial market share vector, forecasting market share across several periods, and identifying the steady-state condition. The results indicate that the initial market shares were 18% for Aqua, 32% for LG, 24% for Polytron, and 26% for Sharp. The forecast shows that Polytron experienced the highest market share growth and became the dominant brand, while LG experienced a significant decline. The steady-state condition was reached in the fifth period, with long-term market shares of 24% for Aqua, 17% for LG, 37% for Polytron, and 23% for Sharp. These findings demonstrate that the Markov Chain method is effective for predicting brand switching behavior and market share distribution, providing valuable support for marketing decisions and inventory management in UMKM XYZ.

Keywords: Markov Chain, brand switching, market share, television, consumer behavior, steady state.

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INTRODUCTION

The rapid advancement of digital broadcasting technology has significantly transformed consumer behavior in the electronics market, particularly in the television industry. The implementation of the Analog Switch-Off (ASO) policy in Indonesia has accelerated the transition from analog to digital broadcasting systems, encouraging consumers to upgrade or replace their television devices with digital-ready televisions and Smart TVs. This transformation has intensified competition among television manufacturers, requiring companies and retailers to understand changes in consumer preferences and purchasing behavior to maintain their competitive position in the market (Pamungkas, 2022; Siregar & Riofita, 2024).

The television market has become increasingly competitive due to continuous technological innovation, improvements in display quality, internet connectivity features, energy efficiency, and after-sales services. Consumers are now more informed and selective when making purchasing decisions because they can easily access product reviews and compare product specifications through digital platforms. Consequently, consumer loyalty toward a particular television brand has become less stable, leading to an increase in brand switching behavior. Brand switching refers to a consumer's decision to move from one brand to another within the same product category because of dissatisfaction, perceived value differences, technological advancements, or marketing influences from competitors (Boeuf, 2019; Schiffman, 2023).

Brand switching has important implications for retailers and manufacturers because it directly affects market share distribution and inventory management decisions. For small and medium-sized enterprises (SMEs), understanding consumer switching behavior is essential to avoid overstocking products with declining demand and understocking products with increasing popularity. Effective forecasting of market share dynamics enables businesses to allocate resources more efficiently and develop targeted marketing strategies to retain existing customers while attracting new ones (Kotler & Armstrong, 2021).

Several studies have investigated brand switching behavior using various analytical approaches. Gifari and Maulana (2022) applied Markov Chain analysis to evaluate consumer switching patterns among laptop brands and found that consumers tend to move toward brands perceived to offer superior quality and value. Similarly, Novianti et al. (2022) employed the Markov Chain method to analyze consumer switching behavior in the traditional headwear market and demonstrated the usefulness of transition probability matrices in forecasting future market positions. Furthermore, Herowati et al. (2025) used Markov Chain analysis to predict smartphone market share dynamics and support strategic marketing decision-making.

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Among the available forecasting techniques, the Markov Chain method has gained considerable attention because of its ability to model stochastic processes and predict future market conditions based on current consumer behavior. Markov Chain analysis assumes that future states depend only on the current state and not on previous historical states, making it particularly suitable for analyzing brand switching behavior and market share evolution (Hillier & Lieberman, 2021). The method employs transition probability matrices to estimate the likelihood of consumers moving from one brand to another and to determine the long-term equilibrium distribution known as the steady state (Tambunan et al., 2022).

Despite the growing application of Markov Chain models in consumer behavior studies, limited research has focused on television brand switching in local retail markets, particularly among SMEs operating in regional areas. Previous studies have primarily examined products such as laptops, smartphones, transportation services, and retail commodities, leaving a research gap regarding consumer switching patterns in the television market. Furthermore, the implementation of digital broadcasting policies has created a unique environment that may influence purchasing decisions and brand preferences differently from other electronic products.

Therefore, this study aims to analyze consumer switching patterns among four major television brands, namely Aqua, LG, Polytron, and Sharp, within the UMKM XYZ market using the Markov Chain approach. Specifically, the study seeks to determine transition probabilities among brands, predict future market share distributions, and identify steady-state market conditions. The findings are expected to provide practical insights for inventory planning, marketing strategy development, and customer retention efforts while contributing to the literature on consumer behavior and market share forecasting in the electronics retail sector.

Literature Review

Television Market and Consumer Behavior

The television industry has experienced substantial transformation due to technological advancements and the digitalization of broadcasting systems. The introduction of digital television services has encouraged consumers to adopt newer television technologies that offer improved picture quality, smart connectivity features, and energy efficiency. As a result, competition among television manufacturers has become increasingly intense, particularly among brands seeking to capture larger market shares through product innovation and customer-oriented strategies (Kotler & Armstrong, 2021).

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Consumer purchasing decisions in the television market are influenced by various factors, including product quality, technological features, price, brand reputation, and after-sales service. According to consumer behavior theory, purchasing decisions are shaped by consumers' perceptions of value and their evaluation of product alternatives. Therefore, television manufacturers continuously compete to enhance product attributes that can attract new customers and retain existing ones (Schiffman, 2023).

Brand and Brand Loyalty

A brand serves as a unique identifier that distinguishes a product from competing products in the marketplace. Beyond its identification function, a brand represents a set of values, expectations, and quality perceptions associated with a product. Strong brands are capable of creating trust, reducing perceived risk, and influencing consumer purchase decisions (Kotler & Armstrong, 2021).

Brand loyalty refers to a consumer's commitment to repeatedly purchase or use a particular brand over time. Loyal customers are less likely to switch to competing brands despite the availability of alternative products. High levels of brand loyalty provide organizations with sustainable competitive advantages through repeat purchases, positive word-of-mouth promotion, and reduced marketing costs (Rather et al., 2022). In the television market, loyalty is often influenced by product reliability, technological innovation, customer satisfaction, and service quality.

Brand Switching Behavior

Brand switching is defined as the process by which consumers change their preference from one brand to another within the same product category. This behavior reflects dynamic consumer preferences and competitive market conditions. Consumers may switch brands due to dissatisfaction with previous products, attractive offers from competitors, technological innovations, or changes in perceived value (Boeuf, 2019).

Previous studies have shown that brand switching behavior is affected by both internal and external factors. Internal factors include dissatisfaction, variety-seeking tendencies, and changing consumer needs. External factors include promotional activities, price competition, advertising effectiveness, product quality, and social influence (Hamdani & Yuliana, 2021). Understanding brand switching behavior is essential because it directly affects customer retention and market share stability.

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Market Share

Market share represents the proportion of total sales captured by a specific company or brand within a particular market. It is widely used as an indicator of competitive position and business performance. A larger market share generally reflects stronger customer acceptance and greater competitive strength (Herowati et al., 2025).

In competitive markets, market share is not static and may change over time as consumers shift their purchasing preferences. Therefore, organizations require forecasting techniques capable of predicting future market share conditions. Accurate market share forecasting enables businesses to optimize inventory management, marketing investments, and strategic planning decisions. For retailers such as UMKM XYZ, understanding market share dynamics is essential for maintaining profitability and responding effectively to changing consumer preferences.

Markov Chain Theory

Markov Chain is a stochastic process that describes transitions between different states over time. The fundamental principle of Markov Chain is that the probability of a future state depends only on the current state and is independent of previous states. This characteristic is commonly known as the Markov property (Hillier & Lieberman, 2021).

The Markov Chain approach has been widely applied in market analysis because it can model consumer movement among competing brands. Each brand is considered a state, and consumer switching behavior is represented through transition probabilities. By analyzing these probabilities, researchers can estimate future market conditions and identify long-term market equilibrium.

Mathematically, the state distribution at period t+1 is obtained by multiplying the state distribution at period t by the transition probability matrix. This iterative process allows researchers to observe market evolution across multiple periods and evaluate future competitive positions.

Transition Probability Matrix

The transition probability matrix is a fundamental component of Markov Chain analysis. It contains the probabilities of consumers remaining with their current brand or switching to another brand within a specified period. Each row of the matrix represents the current state, while each column represents the subsequent state.

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The sum of probabilities in each row must equal one because all possible future outcomes are represented within the matrix. Transition probabilities are calculated using historical consumer behavior data and provide valuable insights into brand loyalty and switching tendencies (Asyrofi et al., 2023).

In marketing applications, transition matrices enable researchers to quantify consumer movement patterns and estimate future market shares based on observed behavioral trends.

Steady-State Analysis

Steady state refers to a long-term equilibrium condition in which market share distributions become stable and no longer change significantly from one period to another. In Markov Chain analysis, steady-state probabilities represent the expected market share of each brand after repeated transitions over an extended period.

Steady-state analysis is important because it provides a long-term perspective on market competition. Businesses can use steady-state information to identify brands that are likely to dominate the market and brands that may lose competitiveness if current consumer behavior patterns persist (Lestari, 2022).

For decision-makers, steady-state results offer strategic insights for product positioning, inventory planning, and customer retention initiatives.

Previous Studies

Several studies have applied Markov Chain models to analyze consumer switching behavior and market share dynamics. Gifari and Maulana (2022) examined laptop brand switching behavior and found that consumers tend to migrate toward brands offering superior quality and perceived value. Novianti et al. (2022) analyzed switching behavior in the traditional product market and demonstrated the effectiveness of transition probability matrices in forecasting future market conditions.

Latifah and Astuti (2021) applied Markov Chain analysis to the logistics service industry and successfully predicted long-term market share distributions. Similarly, Herowati et al. (2025) employed Markov Chain analysis to evaluate smartphone market competition and formulate marketing strategies based on predicted market share changes.

Although previous studies have demonstrated the effectiveness of Markov Chain analysis in various industries, research focusing specifically on television brand switching within local SME retail markets remains limited. Therefore, this study contributes to the existing literature

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by applying Markov Chain analysis to predict television market share dynamics and identify steady-state conditions in the UMKM XYZ market.

METHOD

This study employed a quantitative research approach using the Markov Chain method to analyze consumer brand switching behavior and predict future market share distributions in the television market. The research was conducted at UMKM XYZ, a retail business that sells various television brands. Data were collected through a structured questionnaire distributed to 50 respondents who had experience purchasing or using television products. The selected brands analyzed in this study were Aqua, LG, Polytron, and Sharp, as these brands represented the dominant television products available in the study area.

The collected data consisted of information regarding the respondents' previously used television brand and their current television brand. These data were used to identify consumer switching patterns and construct a transition frequency table. Subsequently, transition probabilities were calculated by dividing the number of consumers switching from one brand to another by the total number of consumers originating from each brand. The resulting probabilities were then organized into a transition probability matrix, which served as the primary input for the Markov Chain analysis.

The analysis was conducted through several stages. First, the initial market share vector was determined based on the proportion of respondents using each television brand. Second, future market shares were predicted by multiplying the market share vector by the transition probability matrix over successive periods. Finally, steady-state analysis was performed through iterative matrix multiplication until the market share values converged and no significant changes occurred between periods. The steady-state condition represents the long-term equilibrium market share distribution and provides insights into the future competitive positions of the television brands in the UMKM XYZ market.

RESULTS AND DISCUSSION

The analysis began by determining the initial market share distribution of the four television brands based on responses from 50 consumers. The results showed that LG had the largest initial market share at 32%, followed by Sharp at 26%, Polytron at 24%, and Aqua at 18%. These findings indicate that LG was the most preferred brand among consumers at the beginning of the observation period. However, the market shares alone do not provide sufficient information about future market dynamics because consumer preferences may change over

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time due to product quality, pricing strategies, technological innovations, and promotional activities.

The transition probability matrix was constructed using consumer switching data collected through the questionnaire survey. The results revealed that consumers of Aqua and Sharp showed a relatively high probability of switching to Polytron, while LG consumers exhibited equal probabilities of switching to Aqua and Polytron. These switching patterns suggest that Polytron possesses a stronger ability to attract consumers from competing brands. The transition matrix also demonstrated that consumer loyalty varied among brands, as reflected in the probabilities of consumers remaining with their current brand. Such information is valuable for understanding competitive interactions and forecasting future market developments.

Market share predictions were generated by multiplying the initial market share vector by the transition probability matrix over successive periods. The results indicated a significant increase in Polytron's market share, rising from 24% initially to approximately 36% in the first period and stabilizing around 37% in subsequent periods. Conversely, LG experienced a substantial decline from 32% to approximately 17%. Aqua and Sharp exhibited moderate fluctuations before approaching stable values. These findings suggest that Polytron has a stronger competitive position in attracting consumers from rival brands, whereas LG faces challenges in retaining its customer base. Similar findings have been reported in previous Markov Chain studies, where brands with higher incoming transition probabilities tend to dominate market share over time.

The steady-state analysis showed that market equilibrium was achieved in the fifth iteration period. At this stage, the market share distribution became relatively stable, with Polytron holding approximately 37% of the market, Aqua 24%, Sharp 23%, and LG 17%. The convergence of market share values indicates that the transition process had reached a long-term equilibrium condition in which further iterations produced negligible changes. This steady-state distribution provides an estimate of the future competitive structure of the television market if current consumer switching behavior remains unchanged.

From a managerial perspective, the results provide important implications for retailers and television manufacturers. Polytron should continue strengthening the factors that attract consumers from competing brands, such as product quality, innovation, and promotional effectiveness. Meanwhile, LG needs to improve customer retention strategies by enhancing product value and customer satisfaction. For UMKM XYZ, the findings can serve as a basis for inventory planning and product stocking decisions, enabling the business to allocate resources

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more effectively according to predicted market demand. Overall, the study demonstrates that the Markov Chain approach is a useful tool for analyzing consumer switching behavior and forecasting long-term market share dynamics in the television industry.

DISCUSSION

The findings of this study demonstrate that consumer switching behavior significantly influences the future distribution of television market share. Although LG held the largest initial market share (32%), the Markov Chain analysis revealed that its market position gradually declined over subsequent periods. This result suggests that a large current market share does not necessarily guarantee long-term market dominance. Consumer preferences are dynamic and may change due to perceived differences in product quality, technological innovation, pricing strategies, and after-sales services. According to Kotler and Armstrong (2021), consumers continuously evaluate competing products and are willing to switch brands when alternative options provide greater value and satisfaction.

The results indicate that Polytron emerged as the strongest competitor in the market, increasing its market share from 24% in the initial period to approximately 37% at steady state. This finding suggests that Polytron possesses a relatively high capability to attract consumers from competing brands. The transition probability matrix showed that consumers from Aqua, LG, and Sharp had considerable probabilities of switching to Polytron. This phenomenon may be associated with consumers' perceptions of product performance, affordability, and technological features offered by Polytron. Similar findings were reported by Gifari and Maulana (2022), who found that consumers tend to migrate toward brands perceived to provide better quality and value. Therefore, the ability to attract consumers from rival brands is an important determinant of long-term market success.

In contrast, LG experienced a continuous decline in market share despite having the largest initial customer base. The steady-state results indicated that LG would hold only 17% of the market in the long run if current switching patterns remain unchanged. This outcome may indicate weaknesses in customer retention compared with competing brands. Consumer dissatisfaction, increasing market alternatives, and aggressive competitor strategies may contribute to the declining loyalty of LG customers. Schiffman (2023) argued that brand loyalty is highly dependent on customer satisfaction and perceived value. When these factors weaken, consumers become more likely to switch to alternative brands that better satisfy their expectations.

The steady-state analysis provides valuable insights into the future structure of market

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competition. The convergence of market share values in the fifth period indicates that the television market would eventually reach a stable equilibrium under existing consumer behavior patterns. At this equilibrium, Polytron would dominate the market, followed by Aqua, Sharp, and LG. The achievement of steady state confirms the usefulness of the Markov Chain approach in forecasting long-term market conditions and evaluating the sustainability of competitive advantages. Similar conclusions have been reported in previous studies that applied Markov Chain analysis to investigate brand switching and market share dynamics in various industries (Herowati et al., 2025; Latifah & Astuti, 2021).

From a managerial perspective, the findings offer several practical implications. Retailers such as UMKM XYZ can use the predicted market shares as a basis for inventory planning and product stocking decisions. Since Polytron is expected to gain a larger market share, increasing inventory levels for this brand may reduce the risk of stock shortages and improve sales performance. Conversely, inventory levels for brands experiencing declining demand should be managed carefully to avoid excessive stock accumulation. Furthermore, television manufacturers can utilize these results to design more effective marketing strategies aimed at strengthening customer loyalty and attracting consumers from competing brands. Consequently, understanding consumer switching behavior is essential for maintaining competitiveness and achieving sustainable growth in the increasingly dynamic television market.

CONCLUSION

This study applied the Markov Chain method to analyze consumer brand switching behavior and predict future market share distribution among four television brands, namely Aqua, LG, Polytron, and Sharp, in the UMKM XYZ market. The results demonstrated that the transition probability matrix effectively captured consumer movement patterns between brands and provided a reliable basis for forecasting market share dynamics. The analysis revealed that Polytron attracted the highest proportion of consumers from competing brands, while LG experienced a gradual decline in customer retention.

The market share prediction results indicated significant changes in brand positions over time. Polytron showed continuous growth and became the dominant brand in subsequent periods, whereas LG experienced the largest decline in market share. Aqua and Sharp displayed moderate fluctuations before approaching stable market positions. These findings highlight the importance of understanding consumer switching behavior as a key determinant of future market performance and competitive advantage.

The steady-state analysis showed that market equilibrium was achieved in the fifth

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period. At this condition, the long-term market share distribution was estimated to be approximately 37% for Polytron, 24% for Aqua, 23% for Sharp, and 17% for LG. These results confirm that the Markov Chain approach is an effective tool for predicting long-term market share distribution and evaluating competitive dynamics. The findings provide valuable insights for retailers and manufacturers in developing marketing strategies, improving customer retention, and optimizing inventory management decisions based on anticipated market demand.

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