# The Influence of Consumer Perceptions on Cross-Buying Intention among Apple Product Users in Pekanbaru City

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## Abstract

This study examined the determinants of cross-buying intention within Apple's product ecosystem among users in Pekanbaru, Indonesia. A quantitative explanatory survey with a deductive design was used to test theory-driven relationships between consumer perceptions and cross-category purchase intentions. Data were collected online from 177 participants; after residency screening, 160 valid responses remained. Constructs comprised perceived product benefit, perceived price attractiveness, perceived convenience, perceived product fit, perceived aesthetic quality, and cross-buying intention. Measurement and structural assessments were conducted using Partial Least Squares Structural Equation Modeling. The measurement model satisfied accepted thresholds for internal consistency, convergent validity, and discriminant validity, and diagnostics indicated no substantive bias from a single measurement source. Structural results showed that perceived aesthetic quality and perceived price attractiveness positively influenced cross-buying intention, whereas perceived convenience, perceived product benefit, and perceived product fit were not significant. The model explained a substantial share of variance in cross-buying intention, indicating strong explanatory power. Overall, the findings suggested that emotional–symbolic value—particularly design coherence and the perception of price as a signal of quality—played a more decisive role than purely functional considerations in motivating cross-category expansion within a premium brand ecosystem. Managerial implications and avenues for future research were outlined.

**Keywords:** Cross-buying intention; Apple ecosystem; perceived aesthetic quality; perceived price attractiveness; perceived product benefit;

## Introduction

The development of digital technology over the past two decades has brought about a profound transformation in consumption patterns and lifestyles across the globe, including Indonesia. Technological innovation no longer merely influences how individuals communicate; it also shapes social and economic structures and even personal identity within the digital sphere (1,2). Devices such as smartphones, laptops, smartwatches, and digital accessories now function as symbolic possessions objects that represent lifestyle, values, and status (3,4). Within this landscape, Apple Inc. occupies a strategic position as a pioneer of a technological ecosystem that is not only functionally integrated but also designed with strong aesthetic and emotional value. The integration among products such as the iPhone, MacBook, Apple Watch, iPad, and AirPods creates a holistic brand experience, which in turn fosters cross-buying namely, consumers' decisions to purchase multiple products from the same brand across different categories (5).

The phenomenon of cross-buying in Apple's ecosystem can be understood through the lens of brand ecosystem loyalty, wherein emotional and symbolic ties between consumers and the brand extend loyalty across the entire product line (6,7). Apple's hallmarks minimalist design, interface simplicity, high quality, and an exclusive image build consumer perception of brand coherence and seamless digital experience. In Indonesia, particularly in the city of Pekanbaru, this trend is prominent among younger generations and young professionals who regard Apple devices as part of their lifestyle identity. They not only adopt a single product but also tend to expand ownership into the full ecosystem as a form of social aspiration and a symbol of class mobility (8,9). Although Apple products are positioned in a premium price segment, perceptions of quality, design elegance, and connectivity convenience drive repeat purchasing across product categories (10,11).

Conceptually, several key factors are believed to influence consumers' cross-buying intention among Apple users. First, perceived product benefit, namely the extent to which consumers evaluate add-on products as delivering functional and symbolic value that enhances prior user experience (12). Second, perceived price attractiveness, which represents consumers' assessments of the fit between price and the value received (13,14). Third, perceived convenience, referring to perceived ease of access, purchase, and use of add-on products within a single digital ecosystem (15). Fourth, perceived product fit, which concerns the perceived functional and aesthetic compatibility between already owned devices and the add-on product (16). Finally, perceived aesthetic quality, namely perceptions of design beauty that trigger emotional attachment and pride of ownership (10,17).

Although prior studies have examined brand loyalty and technology adoption, there remains a limited body of research that explicitly investigates these five factors within the context of cross-buying intention for premium technology brands in emerging markets. Previous research has tended to focus on customer satisfaction, brand attachment, or switching behavior, while cross-category dynamics within a single digital ecosystem have received comparatively less attention (18,11). Accordingly, this study seeks to fill the gap by analyzing the effects of perceived product benefit, perceived price attractiveness, perceived convenience, perceived product fit, and perceived aesthetic quality on cross-buying intention among Apple users in Pekanbaru.

This research is expected to provide empirical contributions to the literature on digital consumer behavior, particularly in the context of technological brand ecosystems. Practically, the findings can inform strategies centered on brand experience and aesthetic continuity, wherein consumer loyalty is maintained not only through functional satisfaction but also through emotional consistency and symbolic value embedded at every brand touchpoint (19–21). Thus, the study not only examines causal relationships among consumer perception variables but also maps how a premium brand like Apple sustains dominance through the management of an integrated ecosystem experience with high emotional value.

**Cross-Buying Behavior**

Cross-buying refers to the phenomenon in which consumers purchase multiple types of products from the same brand, even when those products belong to different categories. This phenomenon often occurs when consumers feel satisfied with the first product they purchased, prompting them to continue purchasing other products offered by the same brand. The process is closely related to the loyalty-enhancement phase in customer relationship management, wherein consumers exhibit stronger attachment to the brand through additional purchases. At this stage, firms benefit from the increasing volume and diversity of purchases, which in turn can extend customer lifetime value and enhance overall profitability (7).

In a retail context, cross-buying is frequently regarded as a deeper form of customer loyalty that entails both emotional and functional ties with the brand. According to Maitzen (16), determinants of cross-buying behavior can be grouped into four major categories: relational aspects, provider-related aspects, consumer-related aspects, and product performance. Relational aspects encompass trust and loyalty; provider-related aspects include elements such as promotions and brand reputation; consumer-related aspects concern convenience and demographics; and performance aspects involve product fit and price perceptions. Given these characteristics, technology devices embedded within an integrated ecosystem such as Apple's product family offer opportunities for consumers to engage in cross-buying through cohesive product design and interconnected user experiences across devices. Additional purchases within such an ecosystem occur naturally because consumers tend to perceive that complementary devices will enhance their overall experience, both functionally and aesthetically.

**Consumer Perception Factors in Cross-Buying Behavior**

This study focuses on five key variables that are believed to influence cross-buying intention: perceived product benefit, perceived price attractiveness, perceived convenience, perceived product fit, and perceived aesthetic quality.

**Perceived Product Benefit** refers to consumers' perceptions of the additional benefits provided by complementary products. In Apple's ecosystem, products such as Apple Watch or AirPods provide added benefits through seamless integration with primary devices like the iPhone or MacBook, thereby increasing both functional and symbolic value. Schultz and Gorlas (12) further note that product benefits are often more strongly perceived through direct interactions with sales staff or physical experiences, although visual technologies such as magic mirror can enhance such interactions.

**Perceived Price Attractiveness** concerns how consumers evaluate a product's price relative to the benefits it offers. Products whose prices are deemed fair and commensurate with perceived quality and benefits tend to increase consumers' intention to engage in cross-buying. Grewal et al. (13) show that attractive price perceptions contribute significantly to purchase decisions, particularly among consumer segments subject to stronger psychological influences, such as female consumers.

**Perceived Convenience** pertains to consumers' perceptions of ease throughout the purchasing process. Within Apple's ecosystem, such convenience is created through streamlined access and integration across devices, for instance via integrated payment systems or data-driven product recommendations. The advent of technologies like augmented reality, which allows consumers to try products virtually, further strengthens perceptions of convenience (15).

**Perceived Product Fit** refers to how consumers evaluate the compatibility between a complementary product and the primary product they already own. In Apple's ecosystem, complementary products such as Apple Watch or AirPods are highly valued for their functional and aesthetic compatibility with primary devices like the iPhone and MacBook. Maitzen (16) emphasizes that product fit can increase consumers' propensity to purchase add-on products, especially when such compatibility is evident both in design and utility.

**Perceived Aesthetic Quality** denotes consumers' perceptions of a product's visual aspects and design. For consumers who view aesthetic design as an important part of their identity, visually well-designed products are more appealing. Bloch (10) argues that aesthetic elements have a substantial impact on enhancing consumer preferences for products, particularly for premium offerings such as those offered by Apple. The beauty of design and visual consistency across products reinforce brand image and increase cross-buying intention.

**Theoretical Model and Conceptual Foundations**

The theoretical model employed in this study integrates two principal theoretical foundations: social exchange theory and schema theory. Social exchange theory, as articulated by Homans (22), posits that consumers' purchase decisions are strongly influenced by their evaluation of benefits obtained relative to the costs incurred. In the context of cross-buying, when consumers judge that complementary products provide benefits exceeding the associated costs—financially or in terms of time—their intention to purchase additional products increases.

Meanwhile, schema theory, introduced by Bartlett (23), states that individuals use pre-existing cognitive structures to assess new information. In Apple's ecosystem, perceptions of product fit and aesthetic quality are shaped by consumers' prior experiences and expectations of the brand. Complementary products that align with the brand's image and consumers' past experiences are more readily accepted and more likely to prompt purchase decisions.

Drawing on these two theories, the study's conceptual model assumes that evaluations of the value of complementary products within Apple's ecosystem are influenced by the five consumer perception factors outlined above. These evaluations, in turn, shape consumers' cross-buying intention, which strengthens as perceived fit, quality, and benefits of the purchased products increase.

**Research Hypotheses**

H1: There is a positive and significant effect of Perceived Aesthetic Quality (PAQ) on Cross-Buying Intention (CBI) among Apple users in Pekanbaru.

H2: There is a positive and significant effect of Perceived Convenience (PC) on Cross-Buying Intention (CBI) among Apple users in Pekanbaru.

H3: There is a positive and significant effect of Perceived Price Attractiveness (PPA) on Cross-Buying Intention (CBI) among Apple users in Pekanbaru.

H4: There is a positive and significant effect of Perceived Product Benefit (PPB) on Cross-Buying Intention (CBI) among Apple users in Pekanbaru.

H5: There is a positive and significant effect of Perceived Product Fit (PPF) on Cross-Buying Intention (CBI) among Apple users in Pekanbaru.

## Research Methods

The model's predictive relevance was further examined using the Stone–Geisser $Q^2$ statistic generated through the blindfolding procedure. A $Q^2$ value greater than zero indicates that the model has predictive relevance for the endogenous construct, whereas values approaching or exceeding 0.35 suggest strong predictive accuracy. Additionally, model fit was assessed using the Standardized Root Mean Square Residual (SRMR), with values below 0.08 indicating a good model fit in PLS-SEM.

Prior to hypothesis testing, descriptive analyses were conducted to summarize respondent characteristics, including age, gender, occupation, and the types and combinations of Apple devices owned. These descriptive statistics provided contextual understanding of user profiles and helped ensure that respondents met the inclusion criteria. Reliability checks and preliminary screening were also performed to detect missing data, outliers, and response inconsistencies.

Ethical considerations were strictly upheld throughout the research process. Participation was voluntary, and respondents were required to provide informed consent before completing the questionnaire. All data were anonymized to protect participant confidentiality, and no personally identifiable information was collected. The research adhered to standard ethical guidelines for online survey–based studies.

Overall, these methodological procedures ensured that the study-maintained rigor in data collection, validity assessment, and structural model testing, providing robust empirical evidence regarding the influence of perceived product benefit, price attractiveness, convenience, product fit, and aesthetic quality on cross-buying intention among Apple users in Pekanbaru.

This methodological design ensures the precision of measurement, empirical reliability, and validity of causal relationships among variables. The combined use of CMV testing, construct reliability and validity evaluation, and structural model assessment through PLS-SEM guarantees results that are objective, replicable, and empirically robust in explaining cross-buying behavior among Apple users in Pekanbaru.
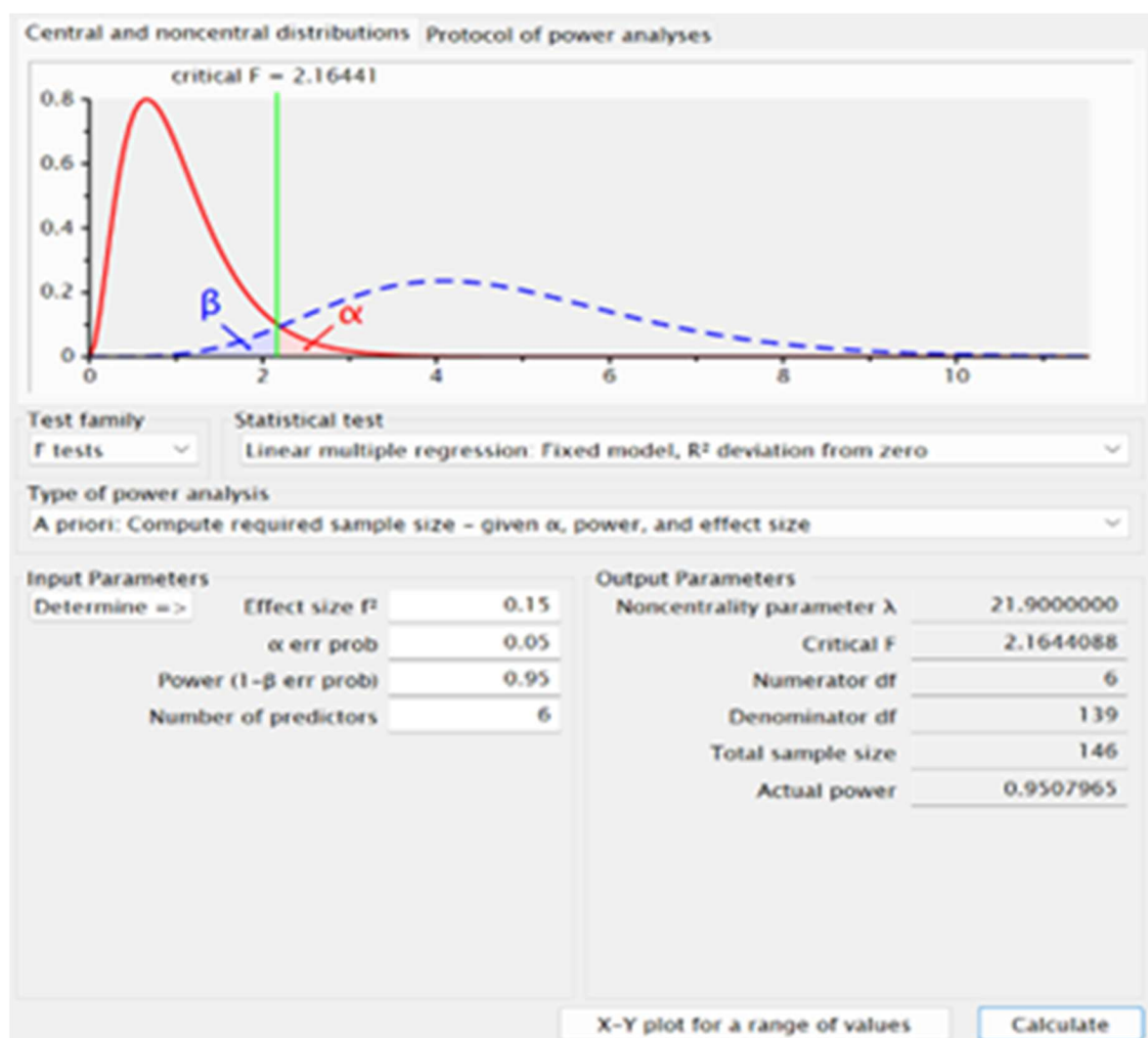


**Figure 1  Sample Size G*Power**

## Result

### Demographic Profile of Respondents

Table 1 presents the demographic characteristics of the 160 respondents comprising the final sample of this study. Initially, 177 participants completed the online questionnaire; however, following data cleaning, 17 respondents were eliminated for not meeting the residency criterion of domiciling in Pekanbaru. This step was undertaken to ensure alignment with the research context, which specifically focuses on the behavior of Apple product users within the Pekanbaru area.

By gender, the majority of respondents are female (63.13%), while males constitute 36.88%. This finding indicates higher engagement among female users in the adoption of Apple products. It is consistent with Bakewell and Mitchell (2006), who show that women tend to be more sensitive to aesthetic aspects and brand image two salient elements of Apple products. Accordingly, the dominance of female respondents reinforces the relevance of the perceived aesthetic quality variable in this study.

In terms of age, most respondents are under 25 years old (54.38%), followed by those aged 26–35 (20.63%), with the remainder over 35. This distribution suggests that Apple users in Pekanbaru are predominantly younger consumers categorized as digital natives (Prensky, 2001). This generation is known for high dependence on technology and often treats digital products as part of personal identity. The finding aligns with (Djafarova & Bowes, 2021), who report that younger consumers are more inclined toward cross-buying due to lifestyle factors and emotional attachment to brands.

Regarding educational attainment, the majority of respondents hold a bachelor's degree (62.50%), followed by high school graduates (26.25%), with smaller proportions holding diplomas and master's degrees. Higher education levels indicate greater cognitive capacity to evaluate product benefits, which is pertinent to perceived product benefit and perceived product fit. As noted by (Schiffman & Wisenblit, 2019), highly educated consumers are more likely to purchase based on rational assessments of product quality and compatibility rather than purely emotional considerations.

With respect to occupation, the largest group comprises students (40.63%), followed by private-sector employees (25%) and entrepreneurs (17.50%). The predominance of students and young professionals suggests that Apple users in Pekanbaru represent productive segments who are active users of digital technology. (Park & Lee, 2009) explain that such groups are more likely to engage in cross-buying behavior as they seek seamless integration across devices, consistent with the perceived convenience variable in this study.

In terms of monthly income, 38.75% of respondents earn below IDR 2,000,000, whereas 24.38% earn above IDR 6,000,000. Despite a sizable portion with lower income, respondents still purchase Apple products. This phenomenon reflects perceived value superiority, namely the perception that Apple's symbolic value and brand prestige outweigh nominal price (Grewal et al., 1998; Vigneron & Johnson, 2004). This observation underscores the relevance of perceived price attractiveness to cross-buying intention.

Finally, with respect to the number of Apple devices owned, a majority of respondents (63.16%) possess two devices—such as an iPhone and AirPods—while others own three or more. This pattern indicates attachment to the Apple ecosystem, whereby users tend to extend their ownership due to perceived ease and synergy across devices. This supports (Kumar, George, et al., 2008), who assert that positive experiences with a primary product increase cross-buying intention within the same brand.

Overall, the results in Table 1 depict Apple users in Pekanbaru as predominantly young, highly educated, and oriented toward a digital lifestyle—consistent with the focus of this research. This

profile supports the analysis that perceptions of product benefits, price, convenience, fit, and aesthetic quality influence cross-buying intention within the Apple ecosystem.

**Table 1 Demographic Profile**

| Characteristic | Size | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 59 | 36.88% |
| Female | 101 | 63.13% |
| **Age** | | |
| <25 | 87 | 54.38% |
| >45 | 16 | 10.00% |
| 26-35 | 33 | 20.63% |
| 36-45 | 24 | 15.00% |
| **Education** | | |
| Diploma | 13 | 8.13% |
| Undergraduate | 100 | 62.50% |
| Graduate | 5 | 3.13% |
| Senior High School | 42 | 26.25% |
| **Occupation** | | |
| Officer | 3 | 1.25% |
| Self-Employee | 1 | 0.63% |
| Freelance | 1 | 0.63% |
| Fresh graduate | 4 | 1.88% |
| Teacher | 3 | 1.88% |
| Honorary Employees | 1 | 0.63% |
| Household | 11 | 3.13% |
| Employee | 40 | 25.00% |
| Model | 2 | 1.25% |
| Student | 65 | 40.63% |
| Unemployment | 1 | 0.63% |
| Entrepreneur | 28 | 17.50% |
| **Income** | | |
| <2.000.000 | 62 | 38.75% |
| >6.000.000 | 39 | 24.38% |
| 2.000.000 - 3.999.999 | 31 | 19.38% |
| 4.000.000 - 5.999.999 | 28 | 17.50% |
| **Apple's Devices** | | |
| 2 | 120 | 63.16% |
| 3 | 25 | 19.74% |
| 4 | 10 | 10.53% |
| 5 | 5 | 6.58% |

### Descriptive Analysis and Normality Assessment

Table 2 presents the descriptive analysis of the study constructs—Perceived Product Benefit (PPB), Perceived Price Attractiveness (PPA), Perceived Convenience (PC), Perceived Product Fit (PPF), Perceived Aesthetic Quality (PAQ), and Cross-Buying Intention (CBI). The purpose of this analysis is to depict respondents' perception levels for each variable and to ensure that the data exhibit an adequate distribution for subsequent analysis using PLS-SEM.

The results indicate that the mean values for all constructs fall within the range of 3.9–4.2, suggesting that respondents generally agree with positive statements regarding the benefits, convenience, fit, and quality of Apple products. The higher average for Cross-Buying Intention reflects a strong propensity among respondents to engage in cross-product purchasing within the Apple ecosystem. This aligns with the findings of (Kumar, George, et al., 2008), which posit that loyalty to one product can strengthen consumers' intentions to purchase other products from the same brand through the synergistic effects of a brand ecosystem.

The standard deviations range between 0.6 and 0.9, indicating moderate variability and relatively homogeneous perceptions among respondents. According to (Sekaran & Bougie, 2016), lower standard deviations signal similarity of perceptions within the respondent group for the measured constructs, whereas moderate variation indicates acceptable diversity in consumer evaluations. This condition underscores that respondents share consistent perceptions of Apple's brand image and product quality.

Furthermore, the skewness and kurtosis values for all constructs lie within recommended thresholds approximately –1 to +1 for skewness and –2 to +2 for kurtosis—following the guidelines of (Hair et al., 2022) and (Kline, 2016). These values indicate that the data distribution approximates normality, suggesting no extreme deviations that might bias estimation. A balanced distribution strengthens the validity and reliability of the results, as PLS-SEM benefits from data with reasonable symmetry to yield more stable path estimates across variables (Hair et al., 2022).

Overall, the descriptive results in Table 2 show that respondents hold positive and consistent perceptions across all study constructs. This supports the relevance of the conceptual model, which assumes that perceptions of product benefits, price, convenience, fit, and aesthetics play roles in enhancing cross-buying intention among Apple users in Pekanbaru.

**Table 2 Descriptive and Normality Statistic**

| Construct | Item Code | Mean | min | max | Standard deviation | Excess kurtosis | Skewness |
|---|---|---|---|---|---|---|---|
| PPB | PPB1 | 3.938 | 1 | 5 | 0.864 | 1.639 | -0.936 |
| | PPB2 | 3.994 | 1 | 5 | 0.771 | 1.511 | -0.734 |
| | PPB3 | 4.075 | 1 | 5 | 0.729 | 1.007 | -0.605 |
| | PPB4 | 4.081 | 2 | 5 | 0.642 | -0.044 | -0.218 |
| | PPB5 | 3.956 | 1 | 5 | 0.769 | 0.744 | -0.59 |
| PPA | PPA1 | 3.85 | 2 | 5 | 0.8 | -0.335 | -0.313 |
| | PPA2 | 3.756 | 1 | 5 | 0.82 | 0.128 | -0.413 |
| | PPA3 | 3.862 | 1 | 5 | 0.818 | 0.26 | -0.502 |
| | PPA4 | 3.65 | 1 | 5 | 0.903 | -0.231 | -0.225 |
| | PPA5 | 3.944 | 1 | 5 | 0.768 | 0.517 | -0.487 |
| PC | PC1 | 3.938 | 1 | 5 | 0.804 | 1.237 | -0.76 |
| | PC2 | 3.856 | 1 | 5 | 0.789 | 0.604 | -0.584 |
| | PC3 | 3.95 | 2 | 5 | 0.757 | -0.401 | -0.266 |
| | PC4 | 3.956 | 1 | 5 | 0.683 | 1.482 | -0.538 |
| | PC5 | 4.025 | 3 | 5 | 0.67 | -0.762 | -0.029 |
| PPF | PPF1 | 3.881 | 1 | 5 | 0.736 | 1.922 | -0.756 |
| | PPF2 | 3.919 | 1 | 5 | 0.758 | 1.648 | -0.731 |
| | PPF3 | 4.037 | 1 | 5 | 0.715 | 2.695 | -0.884 |
| | PPF4 | 4.062 | 1 | 5 | 0.677 | 1.994 | -0.687 |
| | PPF5 | 4 | 1 | 5 | 0.707 | 1.174 | -0.535 |
| PAQ | PAQ1 | 4.162 | 1 | 5 | 0.757 | 1.125 | -0.805 |
| | PAQ2 | 4.294 | 3 | 5 | 0.648 | -0.712 | -0.377 |
| | PAQ3 | 3.65 | 1 | 5 | 0.93 | -0.367 | -0.234 |
| | PAQ4 | 3.831 | 1 | 5 | 0.896 | -0.49 | -0.291 |
| | PAQ5 | 3.925 | 1 | 5 | 0.795 | 0.458 | -0.542 |
| CBI | CBI1 | 4 | 1 | 5 | 0.806 | 0.179 | -0.506 |
| | CBI2 | 3.862 | 1 | 5 | 0.794 | 0.698 | -0.654 |
| | CBI3 | 3.744 | 1 | 5 | 0.831 | -0.257 | -0.147 |
| | CBI4 | 3.931 | 2 | 5 | 0.83 | -0.845 | -0.201 |
| | CBI5 | 3.9 | 2 | 5 | 0.76 | -0.513 | -0.174 |

***Common Method Variance Test***

Table 3 reports the results of the Common Method Variance (CMV) assessment to ensure that the study's data are free from common method bias arising from the use of a single measurement

instrument. The test employed the Full Collinearity Test as recommended by (Kock, 2015), by examining the Variance Inflation Factor (VIF) for each latent construct.

The results show that all VIF values fall within the 2.7–3.5 range. These values satisfy the VIF ≤ 5.0 tolerance criterion recommended by (Hair et al., 2022) as an acceptable threshold for multicollinearity in PLS-SEM structural models. Accordingly, the data can be considered free from the influence of common method bias, and the inter-construct relationships in the model are empirically valid.

These findings indicate that the observed correlations between consumers' perceptions of product benefits, price, convenience, fit, and aesthetic quality and their cross-buying intention reflect substantive relationships among constructs rather than artifacts of a shared measurement source. Therefore, the PLS-SEM model in this study can be interpreted reliably, without concerns regarding common method bias.

**Table 3 Collinear Test**

| Latent Construct | VIF |
|---|---|
| Cross-Buying Intention (CBI) | 2.738 |
| Perceived Aesthetic Quality (PAQ) | 2.968 |
| Perceived Convenience (PC) | 3.053 |
| Perceived Price Attractiveness (PPA) | 3.440 |
| Perceived Product Benefit (PPB) | 3.209 |
| Perceived Product Fit (PPF) | 3.543 |

**Measurement Model Assessment: Construct Validity**

The measurement model represents the relationship between latent variables and their measurement indicators (manifest variables) (12,15). To ensure that the present research model is valid and reliable, construct validity was assessed, namely the extent to which a set of indicators is capable of theoretically representing the latent construct (12). Evaluation of the reflective measurement model was conducted by testing internal consistency, convergent validity, and discriminant validity using SmartPLS. For the formative measurement model, the steps included assessing convergent validity, the significance and relevance of indicator weights, and examining potential collinearity among indicators (12). Figure 2 presents the initial PLS path model developed using SmartPLS, involving all variables in this study: Perceived Product Benefit (PPB), Perceived Price Attractiveness (PPA), Perceived Convenience (PC), Perceived Product Fit (PPF),
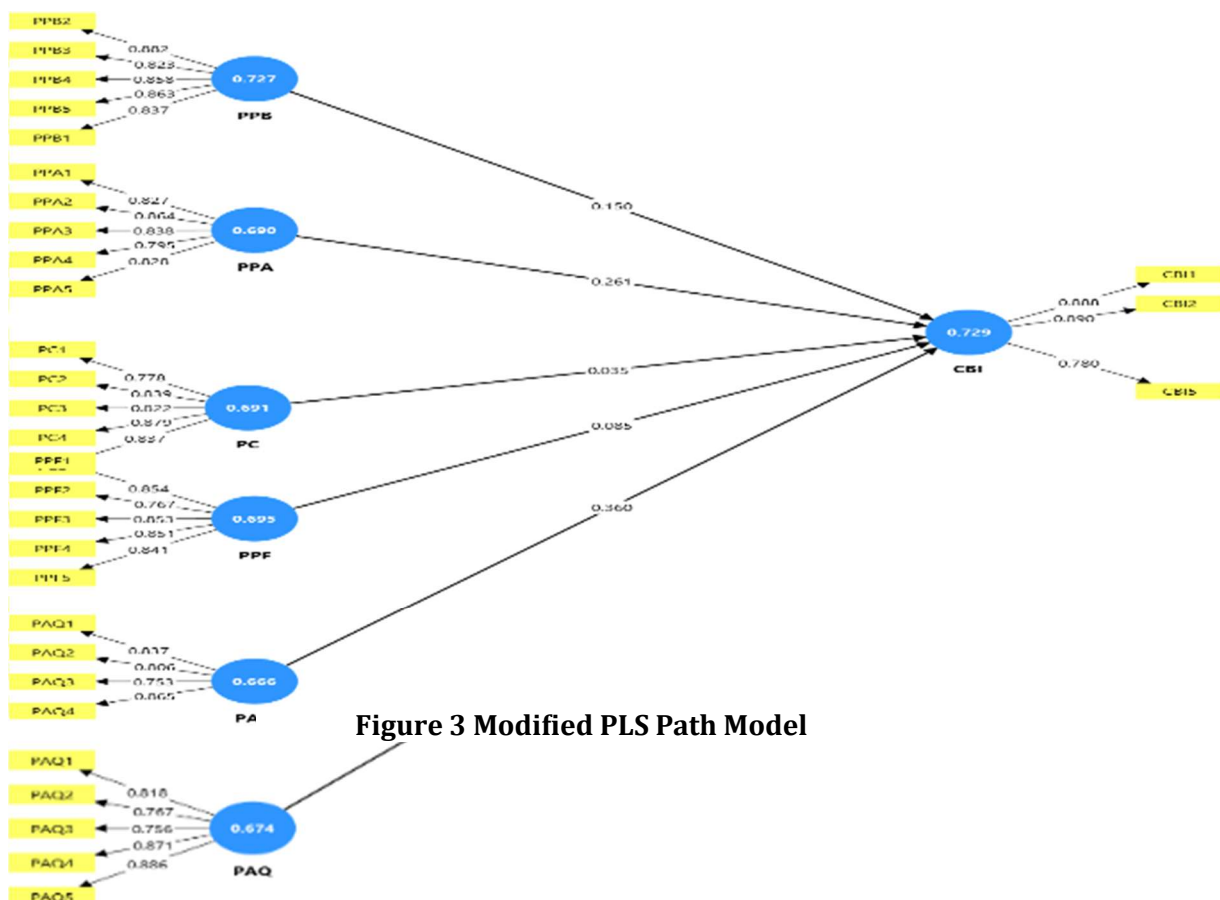
**Figure 2 Initial PLS Path Model**

Perceived Aesthetic Quality (PAQ), and Cross-Buying Intention (CBI). This initial model displays all indicators prior to modification.

However, the preliminary evaluation indicated issues with discriminant validity, wherein several HTMT values exceeded the 0.90 threshold (16), and several indicators exhibited high cross-loadings on non-target constructs. Accordingly, corrective steps were taken by removing indicators with low loadings or overlapping loading patterns to enhance the clarity and reliability of the measurement model. Indicators with outer loadings below 0.70 were sequentially eliminated, following the recommendation that items contributing insufficient variance to their latent construct may weaken convergent validity (12). Additionally, indicators demonstrating cross-loadings greater than their loading on the intended construct were removed to ensure that each item uniquely represented its latent variable (17).

After these refinements, all remaining indicators demonstrated satisfactory psychometric properties. The Cronbach's Alpha and Composite Reliability values for each construct exceeded the recommended minimum of 0.70, indicating strong internal consistency (12). Convergent validity was confirmed through Average Variance Extracted (AVE) values above 0.50 for all constructs, demonstrating that each latent variable was able to explain more than half of the variance in its corresponding indicators (12). Discriminant validity was further verified using the HTMT criterion, with all ratios falling below the 0.90 threshold, signifying adequate distinction among constructs (16).

These improvements ensured that the final measurement model met the required standards of reliability and validity, providing a robust foundation for evaluating the structural model and hypothesis testing.



**Figure 3 Modified PLS Path Model**

After the removal of several indicators, the PLS algorithm was re-run, yielding Figure 3 (Modified PLS Path Model), which shows that all outer loadings for the constructs exceed 0.70, thereby meeting the criterion for convergent validity. The remaining indicators demonstrably measure their respective constructs accurately, as the Composite Reliability (CR) and Average Variance Extracted (AVE) values are above the minimum thresholds of 0.70 and 0.50, respectively—indicating that the model is both reliable and valid (12). This modified path model was used for subsequent analyses because it satisfies the measurement adequacy criteria and exhibits an increase in $R^2$ from 0.681 to 0.729, indicating an enhanced ability of the model to explain variance in Cross-Buying Intention (CBI).

According to Hair et al. (12), non-normal data distributions can affect the outcomes of multivariate analyses. Although the impact is relatively minimal in PLS-SEM, a normality assessment was still conducted to ensure that the data distribution does not deviate excessively from normality. The normality test results indicate that the absolute values of kurtosis and skewness fall within the ranges of 0.024–1.437 and 0.007–0.673, respectively, suggesting that the data are approximately normally distributed. Accordingly, the data are suitable for further analysis within the PLS-SEM structural model.

Convergent validity and internal consistency reliability were evaluated to ensure that the indicators within each construct consistently measure the same underlying concept (12). Convergent validity reflects the extent to which indicators that reflect a latent construct are positively correlated, whereas internal consistency reliability reflects the degree of coherence among indicators within a construct (12).

The results reported in Table 4 show that all indicators have outer loadings above 0.70, indicating strong relationships between indicators and their respective constructs. This finding aligns with Hair et al. (12), who suggest that indicators with loadings ≥ 0.70 make an adequate contribution to the measurement of their latent constructs. Additionally, the Average Variance Extracted (AVE) values for all constructs exceed the 0.50 threshold, indicating that more than 50% of the variance in the indicators is accounted for by their corresponding constructs (18). Cronbach's Alpha and Composite Reliability (CR) values for all constructs also exceed the 0.70 minimum requirement, demonstrating a high level of internal consistency among the indicators (12). This implies that each construct in the study demonstrates strong reliability and is not affected by substantial measurement error.

Collectively, these findings indicate that the constructs employed—namely Perceived Product Benefit (PPB), Perceived Price Attractiveness (PPA), Perceived Convenience (PC), Perceived Product Fit (PPF), Perceived Aesthetic Quality (PAQ), and Cross-Buying Intention (CBI)—satisfy the criteria for convergent validity and internal consistency reliability. Consequently, the measurement model is deemed adequate for proceeding to the structural model (inner model) analysis to test the causal relationships among variables.

**Table 4 Convergent Validity and Internal Consistency Reliability**

| Construct | Item code | Item | Outer loadings | AVE | Cronbach's alpha | rho_a | rho_c |
|-----------|-----------|------|----------------|-----|------------------|-------|-------|
| CBI | CBI1 | | 0.888 | 0.729 | 0.814 | 0.83 | 0.89 |
| | CBI2 | | 0.89 | | | | |
| | CBI5 | | 0.78 | | | | |
| PAQ | PAQ1 | | 0.837 | 0.666 | 0.832 | 0.836 | 0.889 |
| | PAQ2 | | 0.806 | | | | |
| | PAQ3 | | 0.753 | | | | |
| | PAQ4 | | 0.865 | | | | |
| PC | PC1 | | 0.778 | 0.691 | 0.889 | 0.899 | 0.918 |
| | PC2 | | 0.839 | | | | |
| | PC3 | | 0.822 | | | | |
| | PC4 | | 0.879 | | | | |
| | PC5 | | 0.837 | | | | |
| PPA | PPA1 | | 0.827 | 0.69 | 0.887 | 0.888 | 0.917 |

| Construct | Item code | Item | Outer loadings | AVE | Cronbach's alpha | rho_a | rho_c |
|---|---|---|---|---|---|---|---|
| | PPA2 | | 0.864 | | | | |
| | PPA3 | | 0.838 | | | | |
| | PPA4 | | 0.795 | | | | |
| | PPA5 | | 0.828 | | | | |
| PPB | PPB2 | | 0.882 | 0.727 | 0.906 | 0.912 | 0.93 |
| | PPB3 | | 0.823 | | | | |
| | PPB4 | | 0.858 | | | | |
| | PPB5 | | 0.863 | | | | |
| | PPF1 | | 0.854 | 0.695 | 0.89 | 0.892 | 0.919 |
| PPF | PPF2 | | 0.767 | | | | |
| | PPF3 | | 0.853 | | | | |
| | PPF4 | | 0.851 | | | | |
| | PPF5 | | 0.841 | | | | |
| | PPB1 | | 0.837 | | | | |

In addition to convergent validity, this study also examined discriminant validity to ensure that each construct in the measurement model is empirically distinct from the others. Discriminant validity is an essential requirement to confirm that constructs do not measure identical or overlapping conceptual domains (12).

Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT) approach, as recommended by Henseler et al. (13). This method is considered more sensitive than traditional techniques such as the Fornell–Larcker criterion or cross-loading inspection because it more effectively detects excessively high correlations between constructs that may compromise model validity.

Based on the results presented in Table 5, all HTMT values fall below the threshold of 0.90, indicating clear empirical distinctions among constructs. This finding demonstrates that no multicollinearity or conceptual redundancy exists among Perceived Product Benefit (PPB), Perceived Price Attractiveness (PPA), Perceived Convenience (PC), Perceived Product Fit (PPF), Perceived Aesthetic Quality (PAQ), and Cross-Buying Intention (CBI).

These results align with the guidelines proposed by Hair et al. (12) and Henseler et al. (13), who assert that HTMT values below 0.90 confirm the presence of discriminant validity. Therefore, all constructs in the measurement model satisfy the discriminant validity criteria, allowing each latent variable to be interpreted distinctly and free from conceptual overlap.

This condition further confirms that the prior model modification—by removing indicators with high cross-loadings—successfully enhanced the clarity of inter-construct relationships and strengthened the measurement model both conceptually and empirically.

**Table 5 Discriminant Validity : Heterotrait -Monotrait Ratio (HTMT)**

| | CBI | PAQ | PC | PPA | PPB | PPF |
|---|---|---|---|---|---|---|
| CBI | | | | | | |
| PAQ | 0.892 | | | | | |
| PC | 0.740 | 0.784 | | | | |
| PPA | 0.847 | 0.835 | 0.799 | | | |
| PPB | 0.789 | 0.817 | 0.828 | 0.836 | | |
| PPF | 0.796 | 0.837 | 0.857 | 0.867 | 0.823 | |

**Structural Model Assessment: Hypothesis Testing**

Hypotheses were tested after the measurement model was deemed valid and reliable, using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) approach with a bootstrapping procedure of 5,000 resamples via SmartPLS version 4.0. This stage aimed to evaluate the direction and statistical significance of the relationships among latent variables specified in the structural model. The path coefficient (β) indicates the direction of the relationship, whereas the t-statistics

and p-values determine statistical significance. Following (Hair et al., 2022), relationships are considered significant when t-statistics > 1.96 and p-values < 0.05.
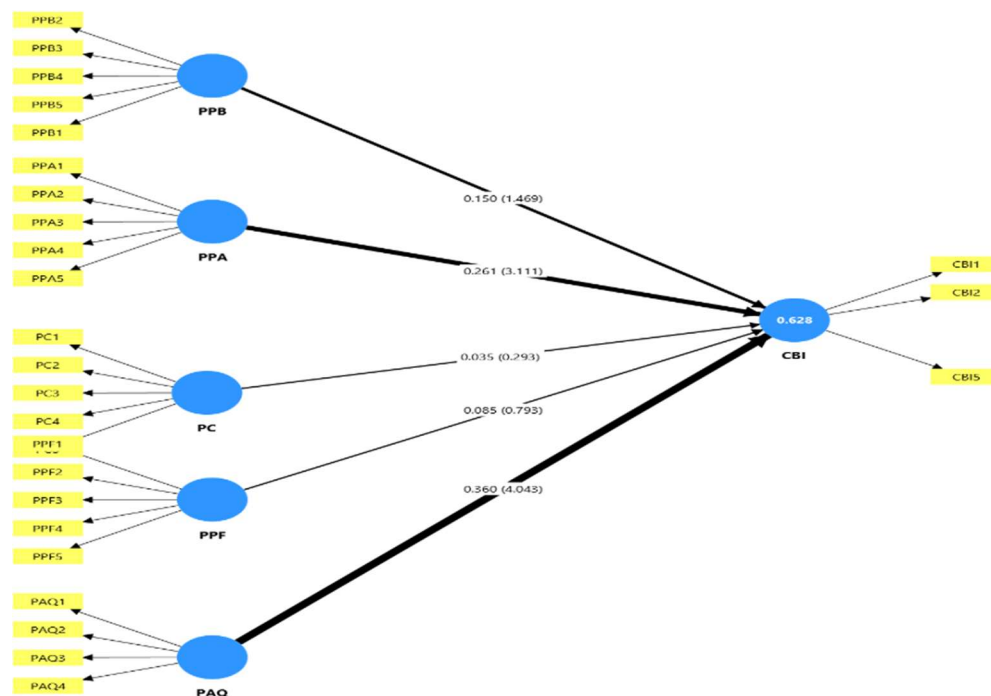


**Figure 4 Hypothesized PLS-Path Model**

The analysis shows that not all hypotheses are empirically supported. Two variables exert a positive and significant influence on Cross-Buying Intention (CBI), namely Perceived Aesthetic Quality (PAQ) ($\beta = 0.360$; $t = 4.043$; $p < 0.001$) and Perceived Price Attractiveness (PPA) ($\beta = 0.261$; $t = 3.111$; $p = 0.001$). This indicates that consistent product design and perceptions of price commensurate with quality are the primary drivers of cross-buying intention among Apple users in Pekanbaru. By contrast, three variables—Perceived Convenience (PC) ($\beta = 0.035$; $t = 0.293$; $p = 0.385$), Perceived Product Benefit (PPB) ($\beta = 0.150$; $t = 1.469$; $p = 0.071$), and Perceived Product Fit (PPF) ($\beta = 0.085$; $t = 0.793$; $p = 0.214$)—do not significantly affect CBI. These results suggest that ease of use, product benefits, and technical fit across devices are not the principal factors encouraging cross-buying in this context.

The $R^2$ value of 0.711 indicates that the independent variables collectively explain approximately 71.1% of the variance in Cross-Buying Intention (CBI). According to Hair et al. (12), an $R^2$ above 0.67 falls into the strong category, implying that the model possesses substantial explanatory power regarding cross-product purchasing behavior. Accordingly, the inter-variable relationships in the structural model can be considered empirically stable and relevant. In addition, the $f^2$ (effect size) values reveal the relative contributions of each independent variable to the model. The largest effect sizes are observed for Perceived Aesthetic Quality ($f^2 = 0.208$) and Perceived Price Attractiveness ($f^2 = 0.146$), indicating medium-to-large effects on CBI, while Perceived Product Benefit, Perceived Convenience, and Perceived Product Fit exhibit small effects (< 0.02). These findings reinforce that emotional dimensions such as aesthetic design and price perceptions exert a dominant influence on cross-buying intention compared with functional factors like benefits and technical fit.

Conceptually, the findings affirm that emotional and symbolic factors exert greater influence than functional factors on cross-buying intention. Apple consumers tend to base their purchase decisions on aesthetic value, premium brand image, and price perceptions that signal prestige, rather than solely on utilitarian product benefits. This view aligns with Bloch (10) and Grewal et al. (6), who argue that aesthetic perceptions and price–value judgments play a pivotal role in

shaping loyalty toward premium brands. Consequently, of the five hypotheses tested, only two (H1 and H3) are empirically supported, indicating that Apple's brand strategy is more effective when emphasizing design and symbolic value to strengthen consumers' cross-buying intention.

**Table 6 Summary Hypothesis**

| Hypotheses | Path | Std. Beta | Std. Error | T value | P values | Bias | Confidence Interval 50% | 95% | VIF | Decisions | R^2 adjusted | F-Square |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H1 | PAQ -> CBI | 0.360 | 0.089 | 4.043 | 0.000 | 0.001 | 0.210 | 0.506 | 2.617 | Supported | 0.628 | 0.137 |
| H2 | PC -> CBI | 0.035 | 0.121 | 0.293 | 0.385 | 0.000 | -0.153 | 0.247 | 3.047 | Not supported | 0.628 | 0.001 |
| H3 | PPA -> CBI | 0.261 | 0.084 | 3.111 | 0.001 | -0.005 | 0.127 | 0.402 | 3.253 | Supported | 0.628 | 0.058 |
| H4 | PPB -> CBI | 0.150 | 0.102 | 1.469 | 0.071 | 0.010 | -0.027 | 0.311 | 3.164 | Not supported | 0.628 | 0.020 |
| H5 | PPF -> CBI | 0.085 | 0.107 | 0.793 | 0.214 | 0.001 | -0.116 | 0.239 | 3.568 | Not supported | 0.628 | 0.006 |

## Discussion

The findings of this study reveal that perceived aesthetic quality and perceived price attractiveness are the primary determinants shaping consumers' cross-buying intention toward Apple products. The brand's consistent and minimalist design fosters a continuous emotional experience across its product lines, reinforcing a unified perception of brand identity. Product aesthetics serve not only a visual function but also a psychological one, shaping symbolic meaning and affective attachment to the brand [10]. Within the context of premium branding, this supports the argument of Hagtvedt and Patrick [11] that aesthetic elements function as a form of aesthetic intelligence, enhancing perceptions of quality and symbolic value. Consequently, consumers' decisions to purchase multiple Apple products are driven not merely by functional needs but by the pursuit of aesthetic consistency and the social prestige attached to the brand [12,13].

Furthermore, perceived price attractiveness plays a crucial role in shaping positive perceived value. Apple consumers do not perceive high prices as barriers; rather, they interpret them as signals of quality, exclusivity, and prestige [6,14]. This aligns with the price–quality inference theory, which posits that higher prices are often associated with product superiority and reliability [15,16]. In this sense, Apple's pricing represents not a cost of purchase but a guarantee of a consistent and elevated experience. This finding reinforces the notion that emotional value, rather than purely utilitarian value, is more influential in fostering cross-product loyalty [17,18].

Conversely, perceived convenience, perceived product benefit, and perceived product fit did not exhibit significant effects on cross-buying intention. This can be explained by the baseline expectation phenomenon, in which consumers already assume functional aspects such as convenience, benefits, and technical compatibility across products to be inherent characteristics of the Apple ecosystem [19,20]. In other words, functional dimensions no longer serve as primary differentiators in cross-buying decisions. This aligns with Oliver [21], who posited that at higher stages of brand loyalty, emotional and symbolic factors become more dominant than mere functional satisfaction. In the realm of premium technology marketing, consistent brand experience and the symbolism of social status emerge as key elements motivating consumers to expand their ownership within a product ecosystem [22,23].

Within the demographic context of Pekanbaru, where most Apple users are young adults and early professionals, cross-buying intention reflects a broader orientation toward a digital lifestyle. Consumers are not merely purchasing products but acquiring continuous experiences and identities through cross-device connectivity. This reinforces the concept of brand ecosystem loyalty proposed by Kumar et al. [24], in which brand loyalty evolves as consumers perceive continuity of value across the brand's entire product portfolio. Strategically, these results suggest that enhancing cross-buying intention should focus on managing symbolic dimensions—through aesthetic design coherence, emotional value communication, and immersive user experience

narratives (1,18,25). Thus, this study contributes theoretically to the understanding of premium consumer behavior and offers practical implications for brand strategies emphasizing aesthetic coherence and perceived value continuity as drivers of cross-product loyalty.

## Conclusion

Cross-buying intention within Apple's ecosystem is primarily driven by emotional and symbolic dimensions, especially aesthetic quality and price attractiveness. Apple's consistent design language creates an affective experience that encourages consumers to expand ownership across multiple product categories. Prices perceived as "fair" are interpreted as signals of quality and prestige, reinforcing Apple's position as a premium brand. In contrast, functional factors such as convenience, product benefits, and technical fit tend to be viewed as baseline attributes that consumers already expect from Apple, making them less influential in motivating cross-category purchase decisions.

The refinement of the measurement model may also shape how constructs are understood, and additional psychological variables such as brand attachment or social norms were not examined. Future research should consider longitudinal or experimental approaches, broader demographic and geographic coverage, and the integration of behavioral data to more precisely capture the mechanisms that drive cross-buying behavior. Practically, strategies to strengthen cross-buying should focus on aesthetic coherence, value-oriented experience communication, and identity-based brand storytelling to encourage deeper engagement within Apple's product ecosystem.

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