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Brand Equity Pathways Toward HoYoverse Merchandise Purchase Intention Among Indonesian Fans

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ABSTRACT

This study examines the direct and indirect relationships between brand awareness and purchase intention for HoYoverse merchandise among Indonesian fans. Perceived quality and brand associations are specified as parallel mediators to distinguish quality-related evaluations from brand meanings in the commercialization of digital game intellectual property. A cross-sectional online survey yielded 457 usable responses from consumers who had played a HoYoverse game within the preceding six months and were familiar with its merchandise. **We analyzed the data using** PLS-SEM in SmartPLS 4, with mediation analysis, Importance-Performance Map Analysis (IPMA), and the Cross-Validated Predictive Ability Test (CVPAT). Brand awareness is positively and directly associated with purchase intention ($\beta = 0.295$). The indirect estimate through brand associations ($\beta = 0.290$) is numerically larger than that through perceived quality ($\beta = 0.067$), their difference was not formally tested. The quality-related paths have comparatively weak support under the reported one-tailed tests. IPMA identifies awareness as the highest-importance candidate for managerial attention. CVPAT indicates lower loss than the indicator-average benchmark and a small aggregate advantage over the linear benchmark, without significant superiority specifically for purchase intention. **The findings extend** brand-equity analysis to physical merchandise associated with digital entertainment and inform testable coordination of content, product, and commerce activities. The design supports conditional associations, not causal effects, realized sales, or gender-equivalent mechanisms.

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1. INTRODUCTION

Digital games support entertainment ecosystems that connect software, characters, stories, online communities, events, and physical merchandise. This creates a management problem for game publishers: audience recognition of digital intellectual property does not necessarily translate into demand for tangible products. Recent game-merchandise research connects purchase intention with consumer culture and brand-related attitudes [1]. Merchandise commercialization therefore requires decisions about how digital brand

knowledge is translated into product evaluation and purchase consideration, rather than assuming that a large player base guarantees merchandise sales [2].

HoYoverse provides a focused setting for this problem because its games offer recognizable characters and fictional worlds that can be represented in figures, acrylic stands, keychains, plush toys, art books, and apparel. This study examines Indonesian consumers already familiar with the brand and its merchandise. It focuses on intentions to purchase physical merchandise, rather than in-game spending, and does not estimate HoYoverse revenue or the size of the Indonesian merchandise market. For technology innovation management in business, the relevant decision is how to commercialize game intellectual property across digital and physical offerings. For digital transformation in organizations, the decision concerns coordination among content teams, community managers, product designers, and commerce channels. A consumer-level model can inform which brand evaluations deserve attention within these activities. It cannot, by itself, demonstrate that an organization has completed a digital transformation or that a particular commercialization strategy produces revenue growth.

Indonesian respondents who already know HoYoverse provide a setting in which recognition, quality expectations, and brand meanings can be distinguished. Familiarity with a game may make related merchandise recognizable, but consumers may still evaluate its expected quality and the meanings attached to the brand before considering a purchase. These evaluations may be correlated without being interchangeable. Separating them is useful because awareness-building, product assurance, and association-building require different managerial activities and performance measures.

The study draws on customer-based brand equity, retaining Aaker and Keller as foundational sources for the distinction between awareness, quality perceptions, and brand associations [3–5]. A directly relevant mediation precedent is provided in the literature [6, 7], with more recent evidence demonstrating that these dimensions do not have uniform relationships with purchase intention across categories [8, 9]. Research on game merchandise [1, 10], webtoon merchandise [11], and fan engagement further motivates examining the meanings surrounding entertainment-related products [12]. These studies support the problem's relevance but do not establish the specific mediation pattern tested here.

The unresolved question is how brand awareness relates to physical game-merchandise purchase intention when perceived quality and brand associations are examined simultaneously as distinct mediating pathways [13, 14]. Previous research provides important but different foundations for addressing this question, particularly in examining the mediating role of brand-equity dimensions in the relationship between brand awareness and purchase intention to establish a relevant precedent for mediation-based analysis [6]. Game-merchandise consumption is investigated through consumer culture theory, focusing on loyalty, ethnocentrism, and cosmopolitanism [1], whereas purchase intention is examined toward virtual game items rather than physical merchandise [11, 15]. Furthermore, fan identification and narrative transportation are explored in relation to the perceived value of webtoon-based merchandise [16, 17]. These studies demonstrate the relevance of brand equity, consumer culture, and fandom-related meanings, but they address different mediating mechanisms, product contexts, or outcomes. The present study extends this literature by estimating the direct relationship between brand awareness and physical merchandise purchase intention alongside two parallel indirect pathways through perceived quality and brand associations within a single model. Its originality therefore lies primarily in the contextual extension and integrated empirical comparison of established customer-based brand equity mechanisms among Indonesian consumers familiar with HoYoverse, rather than in proposing new theoretical constructs or an entirely new framework.

This study estimates a parallel-mediation model, uses Importance-Performance Map Analysis (IPMA) to organize managerial priorities, and applies the Cross-Validated Predictive Ability Test (CVPAT) to distinguish explanatory relationships from predictive benchmark performance. The research question is how brand awareness relates to purchase intention and whether the indirect estimate through brand associations is numerically larger than that through perceived quality. This combination provides an integrated analytical application rather than introducing a new statistical method.

The study has a bounded contribution to sustainable development, particularly in relation to SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure). Regarding SDG target 8.3, which concerns productive activities, entrepreneurship, and the growth of micro-, small-, and medium-sized enterprises, the findings may inform future strategies for connecting game-related intellectual property with legitimate merchandise opportunities. Specifically, brand awareness is positively associated with purchase intention (β = 0.295), while brand associations show a positive indirect relationship between awareness and purchase intention (β = 0.290). These findings may help merchandise publishers and potential creative partners

formulate and evaluate strategies for product recognition and brand communication. In relation to SDG target 9.3, which concerns improving small enterprises' access to financial services and markets and their integration into value chains, the study provides a potential basis for investigating how local creative businesses could participate in legitimate merchandise ecosystems. However, the study does not directly examine cybersecurity, technological infrastructure, employment, enterprise participation, or innovation investment. Its contribution to these SDG objectives is therefore indirect and prospective. Purchase intention is not itself an SDG indicator, and the reported associations do not establish that the study has achieved any SDG target [18, 19].

2. LITERATURE REVIEW

2.1. Purchase intention in interactive entertainment merchandise

Purchase intention denotes a consumer's stated willingness to consider or plan a future purchase. It is distinct from observed transactions, expenditure, or repeat purchasing. In entertainment merchandise, consideration may reflect both product evaluation and meanings connected to the underlying intellectual property. Recent studies of game and webtoon merchandise highlight these meanings [1, 11], but findings from one entertainment category should not be treated as direct evidence about another. This study examines purchase intention for HoYoverse merchandise among consumers familiar with the brand.

Physical merchandise also differs from virtual game items. It requires decisions about a tangible product whose materials, design, delivery, and relation to the source brand may matter. Evidence on virtual-community purchases is therefore relevant background, not a substitute for evidence on physical merchandise. This distinction sets the scope of the outcome and limits any extrapolation to in-game monetization [20].

2.2. Brand awareness

Brand awareness is the ability to recognize or recall a brand in relevant purchasing situations [3, 5]. Recognition can make an option accessible during consideration and reduce the effort needed to identify its origin. Its relationship with intention is nevertheless context-dependent, the direct path may remain after other brand evaluations are included or may be explained by those evaluations [6, 9]. In this study, awareness concerns HoYoverse in relation to merchandise, not simply knowledge of a game title [21].

Repeated exposure to game content and merchandise information provides a plausible basis for familiarity. Awareness alone does not, however, specify whether consumers evaluate the merchandise favorably. The proposed model therefore separates its direct relationship with intention from two possible indirect relationships, one involving judgments of quality and another involving meanings attached to the brand. Exposure frequency and the effectiveness of particular communication channels are not separately measured in this model.

2.3. Perceived quality

Perceived quality is a consumer's subjective assessment of product excellence, rather than an objective inspection of materials or manufacturing [8, 22]. Brand knowledge can cue consumers when they have limited direct product experience. For merchandise, design accuracy, expected execution, and consistency with the source brand are possible aspects of this evaluation. Conceptually, perceived quality reflects how well a product is expected to perform. It should be distinguished from consumer attachment to the brand and verified licensing status [23].

This distinction motivates the quality pathway. Familiarity may make a brand's standards easier to retrieve, supporting favorable expectations about related merchandise. Favorable quality expectations may, in turn, reduce hesitation about considering a purchase. The proposed mediation thus concerns consumer evaluations, not a demonstrated transfer of technical production quality from digital games to manufactured goods.

2.4. Brand associations

Brand associations are meanings and memories linked to a brand in consumer memory [24]. In entertainment settings, these may concern characters, stories, visual identity, or experiences connected with the brand. The construct differs from awareness, which concerns recognition and recall, and from perceived quality, which concerns an evaluation of product excellence. It also differs from specific measures of fan identification or narrative transportation. Evidence related to these constructs cannot automatically be generalized to a general association scale.

Research on merchandise provides a rationale for considering this pathway. Game-merchandise intentions to consumer-culture mechanisms [1], while identification and narrative transportation in relation to perceived webtoon-merchandise value [25]. These studies make brand meaning a plausible interpretive context. They do not establish that the association measure in the present study directly captures every proposed psychological process, particularly belonging, nostalgia, or character attachment [26].

2.5. Hypothesis development

A recognizable brand is more likely to enter a consumer's consideration set, providing a direct route from awareness to intention [3, 5]. This relationship need not disappear when consumers also evaluate quality and brand meanings. Because earlier mediation research questions whether awareness consistently has an independent association with intention [27, 28], the direct path is retained and tested alongside the mediators.

H1: Brand awareness is positively associated with purchase intention toward HoYoverse merchandise.

Awareness may be associated with perceived quality because a familiar brand offers an accessible evaluative cue under uncertainty [6, 29]. For merchandise, consumers may use their knowledge of HoYoverse when forming expectations before handling a product. The hypothesis concerns a positive relationship between familiarity and quality judgments, without presuming that familiarity objectively certifies authenticity or production standards [30].

H2: Brand awareness is positively associated with perceived quality of HoYoverse merchandise.

Recognition supplies a memory cue to which consumers can connect brand-related information [31]. Greater awareness may therefore accompany more accessible and favorable associations. In the present context, merchandise can remind consumers of the underlying entertainment brand, providing a reason to expect awareness and brand associations to be positively related. Exposure and association formation are theoretical explanations rather than longitudinally observed events.

H3: Brand awareness is positively associated with brand associations related to HoYoverse merchandise.

Favorable quality evaluations can reduce perceived uncertainty about whether a product merits consideration [9, 29]. Consumers who expect HoYoverse merchandise to meet their standards should consequently report greater purchase intention, holding awareness and associations constant. The magnitude of this relationship remains an empirical question because other evaluations may explain more variation in intention [32].

H4: Perceived quality is positively associated with purchase intention toward HoYoverse merchandise.

Favorable brand associations can make merchandise personally relevant and distinguish it from otherwise similar products [31]. Merchandise research provides contextual support for examining such meanings [1, 11]. Accordingly, positive associations are expected to accompany stronger purchase intention after awareness and perceived quality are considered, without assuming that any one unmeasured emotional process accounts for the relationship.

H5: Brand associations are positively associated with purchase intention toward HoYoverse merchandise.

Mediating role of perceived quality and brand associations The quality-mediated route combines H2 and H4. Awareness offers an evaluative cue that is associated with perceived quality, which in turn is associated with purchase intention. This route explains why awareness may relate to intention indirectly even when a direct relationship remains. Prior brand-equity mediation research motivates this specification [33]. The mechanism is distinct from mere recognition because it requires an intervening evaluation of product excellence [34].

Recent evidence from electric-vehicle adoption shows that perceived quality and brand associations can relate to intention even when the direct awareness path is not significant [35]. This supports separating the constructs, but does not establish the same mediation structure for merchandise. The current study therefore explicitly tests the product of the awareness-to-quality and quality-to-intention paths [36].

H6: Perceived quality mediates the positive relationship between brand awareness and purchase intention toward HoYoverse merchandise.

The association-mediated route combines H3 and H5. Awareness makes brand information accessible, which can support favorable associations and make the merchandise more relevant to purchase consideration. Entertainment-merchandise research motivates this interpretation [11, 37]. Unlike the quality route, its proposed intervening evaluation concerns meanings connected with the brand rather than the expected excellence of the physical product.

The mediators are specified in parallel because the theoretical comparison concerns two distinct routes from awareness to intention. Neither mediator is assumed to cause the other, and no serial mediation is estimated. The framework therefore permits the quality-related and association-related indirect estimates to be considered within one model, while leaving their temporal sequence and causal status for longitudinal or experimental research.

H7: Brand associations mediate the positive relationship between brand awareness and purchase intention toward HoYoverse merchandise.

Gender is included as an observed control directed at purchase intention, informed by research considering gender in online game-product consumption [38]. It is not a substantive hypothesis. This adjustment addresses one measured demographic characteristic it does not eliminate unmeasured confounding, establish measurement invariance, or test whether structural relationships are equal across gender groups [39].

2.6. Conceptual framework

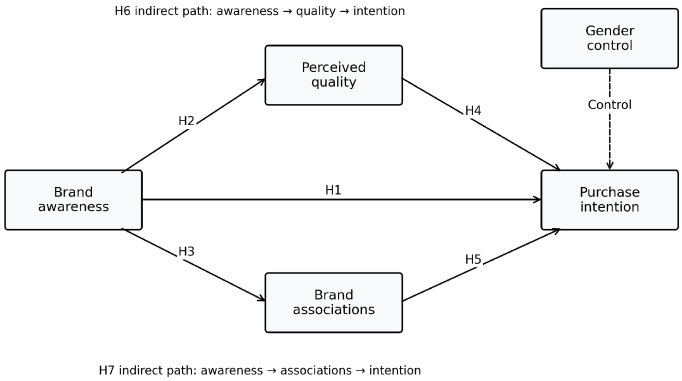


Figure 1. Conceptual Framework

Figure 1 presents the conceptual framework of the study, illustrating the hypothesized relationships between brand awareness and purchase intention toward HoYoverse merchandise. The framework specifies a direct relationship between brand awareness and purchase intention, alongside two parallel indirect pathways through perceived quality and brand associations. These pathways represent distinct aspects of consumer brand evaluation and are examined simultaneously in the proposed model. Gender is included as a control variable directed toward purchase intention. The framework provides the basis for the hypotheses tested using PLS-SEM.

3. RESEARCH METHODOLOGY

3.1. Research design and analytical approach

This study used a quantitative explanatory design with cross-sectional survey data. The unit of analysis was an individual Indonesian consumer familiar with HoYoverse and its merchandise. The design permits estimation of conditional associations among the specified constructs. The proposed directions follow theory, but simultaneous measurement does not establish temporal precedence, rule out reverse relationships, or identify causal effects.

PLS-SEM was implemented in SmartPLS 4 to evaluate the measurement and structural models and to estimate the direct and parallel indirect relationships among brand awareness, perceived quality, brand associations, and purchase intention [40–42]. This approach was selected because the study aims to examine theoretically specified relationships among multiple latent constructs while also assessing the model's predictive performance. The analytical strategy uses several complementary procedures. Measurement-model assessment evaluates internal consistency, convergent validity, and discriminant validity. Structural-model assessment examines path coefficients and explained variance. Mediation analysis estimates indirect relationships through perceived quality and brand associations. IPMA identifies constructs that require managerial attention, while CVPAT compares predictive loss against indicator-average and linear-model benchmarks. These procedures

address distinct explanatory, measurement, managerial, and predictive objectives. Their results are interpreted within the limits of the cross-sectional survey design and are not treated as evidence of causal effects or guaranteed predictive performance in other populations. The analytical procedures serve complementary purposes. Structural model assessment evaluates the estimated relationships among the constructs, while mediation analysis examines whether the relationships between brand awareness and purchase intention include indirect pathways through perceived quality and brand associations. IPMA subsequently identifies constructs that combine relative importance with their observed performance scores, providing a descriptive basis for managerial prioritization. CVPAT evaluates cross-validated prediction loss against Indicator-Average (IA) and Linear-Model (LM) benchmarks, adding predictive evidence beyond the assessment of explanatory relationships. Together, these procedures provide a structured assessment of the proposed relationships, potential managerial priorities, and benchmark-based predictive performance, while not establishing causal mechanisms or guaranteeing prediction accuracy in other populations. H1–H7 are directional, and their reported probabilities follow the one-tailed interpretation used in the original analysis. Statistical support is evaluated at 0.05. This distinction matters for the relatively weak quality-related paths do not confuse it with a two-tailed test.

3.2. Population, sample, and data collection

The target population consisted of Indonesian consumers familiar with HoYoverse and its merchandise ecosystem. Purposive sampling limited participation to respondents who had played at least one HoYoverse game within the six months before data collection and were familiar with its merchandise through purchase, purchase consideration, online exposure, community discussion, or event exposure. Thus, prior merchandise purchase was not mandatory. Screening questions preceded the construct items, so respondents first confirmed both game experience and merchandise familiarity before proceeding. The merchandise-familiarity criterion differs from game familiarity, although these self-reported criteria do not independently verify actual purchasing or product knowledge.

The online questionnaire was administered in April 2026 through Google Forms and distributed through HoYoverse-related online fan communities, social-media groups, and peer-sharing channels. The final dataset contained 457 usable responses after applying the screening criteria. Purchase intention has four incoming paths when the gender control is included, rather than three. Sample size is reported descriptively. The ten-times rule is not considered sufficient evidence of statistical power, representativeness, or protection against selection bias. Therefore, the findings are limited to relationships within the recruited sample. The nonprobability sampling design does not support population prevalence estimates or design-based margin-of-error calculations.

3.3. Measurement instrument

The questionnaire measured brand awareness, perceived quality, brand associations, and purchase intention on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The model treats these constructs as reflective. Customer-based brand-equity theory and the mediation precedent provide their conceptual basis [3, 5, 6], a conceptual citation does not, by itself, establish the source of each questionnaire item.

Brand awareness concerns recognition and recall of HoYoverse in a merchandise context. Perceived quality concerns expected product excellence and consistency with brand standards. Brand associations concern the meanings connected with the merchandise and underlying brand. Purchase intention concerns willingness and consideration to buy. Table 1 reports item codes and outer loadings for measurement transparency. Contextual references explain the domain but should not be treated as distinct subdimensions without item-level validation.

3.4. Measurement and structural model assessment

Measurement assessment distinguishes three questions [40, 42]. Internal consistency is evaluated through Cronbach's alpha and composite reliability. Convergent validity is assessed using average variance extracted (AVE), along with inspection of individual outer loadings. Discriminant validity is examined with the heterotrait-monotrait ratio (HTMT). The interpretive benchmarks are reliability above 0.70, AVE above 0.50, and HTMT below 0.85. Construct-level summaries cannot replace inspection of indicator loadings, cross-construct content overlap, or the wording of retained and removed items.

Structural assessment considers R, adjusted R, standardized path coefficients, reported bootstrap t-statistics and probabilities, and specific indirect estimates. Coefficients describe the estimated relationships conditional on the specified model. Comparing their numerical magnitudes is descriptive, a formal comparison

requires a test of the difference. Similarly, a coefficient is not Cohen's f, which requires assessment of the change in explained variance when a predictor is omitted.

Gender was coded 0 for male respondents and 1 for female respondents and entered as an observed predictor of purchase intention. It is not a reflective multi-item construct and is excluded from the HTMT matrix. Its coefficient is interpreted as a conditional control association. A nonsignificant control path does not establish gender equivalence, and this coding does not capture identities outside the two recorded categories.

The analyses address complementary questions. PLS-SEM estimates conditional relationships, and mediation decomposes the awareness relationship into direct and specific indirect components. IPMA adds performance scores on a 0–100 scale to importance estimates, providing a descriptive basis for prioritizing activities [42, 43]. CVPAT compares cross-validated prediction loss with Indicator-Average (IA) and Linear-Model (LM) benchmarks [44, 45]. R^2 concerns in-sample explanation, whereas CVPAT concerns relative prediction under the selected cross-validation procedure. These analyses do not establish the causal return on a managerial intervention.

4. RESULTS AND DISCUSSION

4.1. Measurement model results

Table 1. Indicator outer loadings

Brand awareness	Loading	Brand associations	Loading	Perceived quality	Loading	Purchase intention	Loading
BAWR1	0.774	BASS1	0.731	PQL1	0.767	PINT1	0.767
BAWR2	0.723	BASS2	0.752	PQL2	0.782	PINT2	0.779
BAWR3	0.699	BASS3	0.749	PQL3	0.747	PINT3	0.691
BAWR4	0.770	BASS4	0.749	PQL4	0.759	PINT4	0.778
BAWR5	0.726	BASS5	0.777	PQL5	0.775	PINT5	0.793
BAWR6	0.748	BASS6	0.740	PQL6	0.736	PINT6	0.782
BAWR7	0.735	BASS7	0.768	PQL7	0.728	PINT7	0.683

Table 1 reports the retained reflective indicators and their outer loadings. Most indicators exceed 0.70. BAWR3, PINT3, and PINT7 are marginally below 0.70, but they were retained because their constructs meet composite reliability and AVE thresholds and because the items remain conceptually relevant to the construct domains. Gender is not included because it is an observed control variable rather than a reflective latent construct.

Table 2. Construct reliability and convergent validity

Construct	Cronbach's alpha	Composite reliability	AVE
Brand associations	0.872	0.901	0.566
Brand awareness	0.862	0.894	0.547
Purchase intention	0.873	0.902	0.569
Perceived quality	0.876	0.903	0.572

Table 2 demonstrates internal consistency at the construct level, with Cronbach's alpha ranging from 0.862 to 0.876 and composite reliability ranging from 0.894 to 0.903. AVE ranges from 0.547 to 0.572, exceeding 0.50 and supporting convergent validity at this aggregate level. These results address consistency and shared indicator variance separately. They do not establish that every individual indicator is satisfactory or that the measurement instrument fully covers the intended construct domain.

Table 3. HTMT results

Construct	Associations	Awareness	Quality	Intention
Brand associations	—			
Brand awareness	0.800	—		
Perceived quality	0.756	0.749	—	
Purchase intention	0.784	0.747	0.645	—

Table 3 presents HTMT among the four latent constructs. Values range from 0.645 to 0.800, below the 0.85 benchmark. The highest value is 0.800 between brand associations and brand awareness the value between perceived quality and brand awareness is 0.749. These point estimates support discriminant validity under the stated criterion. They are not a substitute for bootstrap confidence intervals or a content-based assessment of the questionnaire.

4.2. Structural model results

Table 4. R-square results

Endogenous construct	R-square	Adjusted R-square
Brand associations	0.483	0.482
Purchase intention	0.538	0.534
Perceived quality	0.432	0.431

Table 4 reports R^2 values for perceived quality (0.432), brand associations (0.483), and purchase intention (0.538), with corresponding adjusted values of 0.431, 0.482, and 0.534. Purchase intention shows the highest explained variance among endogenous constructs. These statistics summarize in-sample explanation and do not establish causality or out-of-sample predictive performance.

Table 5. Direct-effect hypothesis testing

Test	Path	β	t-statistic	p-value	Decision
H1	Brand awareness → Purchase intention	0.295	4.438	< 0.001	Supported
H2	Brand awareness → Perceived quality	0.658	23.108	< 0.001	Supported
H3	Brand awareness → Brand associations	0.695	18.729	< 0.001	Supported
H4	Perceived quality → Purchase intention	0.102	1.966	0.025	Supported
H5	Brand associations → Purchase intention	0.417	6.736	< 0.001	Supported
Gender control	Gender → Purchase intention	-0.007	0.107	0.457	Not significant

Table 5 shows positive direct paths from awareness to purchase intention ($\beta = 0.295$, $t = 4.438$, $p < 0.001$), perceived quality ($\beta = 0.658$, $t = 23.108$, $p < 0.001$), and brand associations ($\beta = 0.695$, $t = 18.729$, $p < 0.001$). These reported results support H1–H3 under the directional testing convention. The awareness-to-associations path is numerically the largest direct coefficient in the model.

For purchase intention, the coefficient for brand associations is 0.417 ($t = 6.736$, $p < 0.001$), compared with 0.102 for perceived quality ($t = 1.966$, one-tailed $p = 0.025$). H5 is supported, while support for H4 is close to the directional significance threshold. The association coefficient is approximately 4.1 times the quality coefficient, a descriptive comparison rather than a tested difference. The gender estimate is negligible ($\beta = -0.007$, $t = 0.107$), the reported p-value is 0.457 under the source output's tail convention. No meaningful conditional gender association is supported, without testing path equality across groups.

Table 6. Specific indirect effects

Test	Indirect path	β	t-statistic	p-value	Decision
H6	Brand awareness → Perceived quality → Purchase intention	0.067	1.947	0.026	Supported
H7	Brand awareness → Brand associations → Purchase intention	0.290	6.396	< 0.001	Supported

Table 6 reports an indirect estimate of 0.067 through perceived quality ($t = 1.947$, one-tailed $p = 0.026$) and 0.290 through brand associations ($t = 6.396$, $p < 0.001$). H6 and H7 are supported under the reported directional convention. The latter estimate is approximately 4.3 times the former. No bootstrap contrast of the two indirect estimates is reported, so their difference is not claimed to be statistically significant.

Table 7. Total indirect effect

Path	β	t-statistic	p-value
Brand awareness → Purchase intention	0.357	7.568	¡ 0.001

Table 7 gives a total indirect estimate of 0.357 ($t = 7.568$, $p < 0.001$). Positive direct and indirect estimates are consistent with complementary partial mediation as a statistical pattern, but do not establish a causal mechanism.

4.3. Importance-performance map analysis

Table 8. Importance-performance map analysis for purchase intention

Construct	Importance	Performance	Managerial reading
Brand awareness	0.651	82.02	Candidate for awareness tests
Brand associations	0.417	82.59	Candidate for association tests
Perceived quality	0.102	84.63	Maintain product assurance

With purchase intention as the target, Table 8 reports awareness as having the highest importance (0.651) and performance of 82.02. Brand associations have an importance of 0.417 and a performance of 82.59, perceived quality has an importance of 0.102 and a performance of 84.63. These are descriptive scores for the recruited respondents. Gender is excluded from the managerial comparison because its binary coding is not an improvable performance attribute.

Awareness is a candidate priority because it combines the highest reported importance with the lowest performance among the three actionable constructs. Nevertheless, all three performance scores are relatively high, and the gap between awareness and associations is only 0.57 points. The map therefore suggests where managers might investigate opportunities, it does not quantify the sales return from a campaign or show that an additional unit of awareness can be purchased at lower cost.

Perceived quality has the highest reported performance and the smallest coefficient. This supports maintaining product assurance while testing awareness and association activities, rather than assuming that quality has no commercial value. IPMA does not establish quality as a necessary condition, and the survey cannot determine whether relatively high quality scores reflect ceiling effects or prior selection into the fan sample. Priorities should also consider costs, feasibility, and actual conversion data.

4.4. Cross-validated predictive ability test

Table 9. Cross-validated predictive ability test results

	IA			LM		
	Loss difference	t	p	Loss difference	t	p
Brand associations	-0.122	6.149	< 0.001	-0.004	1.632	0.103
Perceived quality	-0.163	8.084	< 0.001	-0.007	1.545	0.123
Purchase intention	-0.113	5.308	< 0.001	-0.005	1.584	0.114
Overall	-0.133	7.681	< 0.001	-0.005	2.564	0.011

Table 9 compares cross-validated losses, defined as the PLS-SEM loss minus the benchmark loss. A negative difference favors PLS-SEM. Against IA, differences are negative and significant for brand associations (-0.122), perceived quality (-0.163), purchase intention (-0.113), and the overall model (-0.133), all with p < 0.001. This provides evidence of lower loss than the simple IA benchmark under the implemented procedure. It does not identify an absolute level of prediction accuracy.

The construct-level differences against LM are small and statistically insignificant, with p = 0.103 for brand associations, p = 0.123 for perceived quality, and p = 0.114 for purchase intention. The overall difference is -0.005 (t = 2.564, p = 0.011). Thus, the reported aggregate comparison favors PLS-SEM, but it does not show statistically supported superiority over LM specifically for purchase intention. The loss scale and practical consequences must be known before describing the gain as commercially meaningful. Cross-validation within this sample is also distinct from validation in another country, community, or period.

4.5. Discussion

The positive direct awareness path indicates that recognition retains an association with merchandise intention after quality and brand associations are included. This qualifies an interpretation in which awareness matters only indirectly. In contrast, prior research on electric-vehicle models reports no significant direct awareness-to-intention path [9]. Differences in products, samples, and model specification prevent a controlled

cross-study comparison, but the contrast supports treating the role of awareness as context-dependent rather than universal.

The awareness-to-associations coefficient is numerically larger than the awareness-to-quality coefficient, and associations have the largest direct coefficient among the three latent predictors of intention. This pattern is consistent with examining brand meaning when commercializing game intellectual property. It does not establish whether repeated exposure creates associations or whether already interested fans seek greater exposure. The same cross-sectional relationships can be compatible with more than one temporal explanation.

Game-merchandise purchase intention is connected with loyalty and cultural attitudes in a Taiwanese sample [37]. The present study extends that topic by estimating quality-related and association-related indirect paths simultaneously in an Indonesian HoYoverse sample. It does not retest their cultural-attitude mechanisms. An analysis of webtoon merchandise value offers a related perspective on fandom meanings, but its constructs and outcome differ from the present association and purchase-intention measures [11, 46].

The larger association-related estimate is compatible with a symbolic-consumption interpretation. However, affection, belonging, nostalgia, and recognition within a community were not independently established by this model. These concepts are plausible explanations for future qualitative or more specific quantitative research, rather than observed findings about all Indonesian fans. This qualification keeps the theoretical interpretation proportional to the constructs and design.

Perceived quality remains positively related to intention, but its estimated relationship is comparatively small, and its significance is sensitive to the directional testing convention. A small partial coefficient does not mean quality can be neglected, nor does it prove that quality is necessary. Instead, the finding indicates that quality explains less incremental variation in intention in this model than associations do. Predictor overlap, measurement characteristics, and restricted variation are alternative explanations to investigate.

The mediation pattern provides a decomposition of the awareness relationship. The association-related indirect estimate is numerically larger, while a direct relationship between awareness and purchase intention remains. This extends the mediation question posed in earlier brand-equity research to physical merchandise associated with a digital entertainment brand [33]. The evidence supports a model of coexisting pathways, not a claim that one psychological mechanism is dominant. A bootstrap contrast and temporal data would be required to strengthen that conclusion.

The managerial significance of this study lies in clarifying how consumer evaluations may inform the commercialization of digital game intellectual property through physical merchandise. The positive direct relationship between brand awareness and purchase intention (β = 0.295), together with the indirect estimates through perceived quality (β = 0.067) and brand associations (β = 0.290), indicates that merchandise consideration is associated with more than brand recognition alone. For game publishers and merchandise partners, these findings provide a basis for coordinating three management activities, making authorized merchandise recognizable within the broader game ecosystem, communicating the meanings associated with game-related products, and maintaining credible product-quality information. The association-related indirect estimate is numerically larger than the quality-related estimate. However, their difference was not formally tested, so the results do not establish that brand associations are statistically more influential than perceived quality. Instead, the findings provide a context-specific basis for designing and evaluating merchandise strategies. The study did not measure organizational capability, profitability, customer retention, or actual transformation outcomes, so these potential benefits require separate evaluation using behavioral and organizational data.

5. MANAGERIAL IMPLICATIONS

The managerial implications of this study are grounded in the observed relationships among brand awareness, perceived quality, brand associations, and purchase intention. Brand awareness has a positive direct relationship with purchase intention ($\beta = 0.295$), while its indirect estimates through brand associations ($\beta = 0.290$) and perceived quality ($\beta = 0.067$) indicate that merchandise consideration is associated with both brand-related meanings and quality evaluations. Although the association-related indirect estimate is numerically larger, the difference between the two indirect effects was not formally tested. Therefore, managers should interpret these findings as evidence for evaluating multiple merchandise-management activities rather than as proof that one strategy will outperform another. For game publishers and merchandise partners, the results provide a context-specific basis for coordinating brand communication, product presentation, and quality assurance when commercializing digital game intellectual property through physical merchandise.

The methodological contribution involves the complementary use of four established analyses. Path estimation examines whether the specified variables are conditionally related. Mediation identifies indirect effects, IPMA provides performance information for prioritization, and CVPAT evaluates relative prediction loss. The results are informative precisely because these questions can yield different conclusions. Moderate in-sample explanation and significant paths coexist with a nonsignificant purchase-intention comparison against LM.

The awareness findings suggest testing clearer links between official merchandise, familiar game titles, and characters through consistent product naming, authorized storefronts, and game-update campaigns, measured by recognition surveys, product-page visits, and conversions. Meanwhile, the association findings suggest testing licensed character-linked descriptions and visuals against standard product pages, controlling price and availability, and measuring engagement, wish-list additions, and purchases. These are proposed experiments, not validated interventions.

The quality result supports maintaining accurate specifications, materials information, close-up product images, packaging standards, and clear complaint procedures. Product and customer-service teams could monitor defect complaints, returns, and expectation gaps alongside survey evaluations. The expected managerial benefit is more consistent product assurance, which remains a proposal to evaluate. Budget decisions should consider implementation costs and customer outcomes, since standardized coefficients alone do not provide an allocation rule.

The public-policy context provides boundaries for these activities. Presidential Regulation No. 19 of 2024 establishes a framework for accelerating Indonesia's national game industry [47], the present case concerns an international brand and does not demonstrate benefits for domestic developers. Customer-data collection and campaign measurement should be designed with attention to Indonesia's Personal Data Protection Law No. 27 of 2022 [48]. For SDG 8.3, a potential application is transparent, fairly compensated participation by eligible local creative businesses for SDG 9.3, it is integration of small enterprises into relevant value chains [49–51]. The study did not measure employment creation, enterprise participation, or SDG progress. These are explicit criteria for evaluating future implementation, not outcomes attributed to merchandise intention.

6. CONCLUSION

Among 457 Indonesian respondents familiar with HoYoverse, brand awareness is positively associated with merchandise purchase intention directly and through the two proposed mediators. The association-related indirect estimate is numerically larger than the quality-related estimate, while the latter is comparatively weak under the reported one-tailed tests. The study's contribution is a contextual comparison of coexisting brand-equity pathways in physical merchandise linked to digital entertainment, rather than proof of causal mediation or specific fan emotions. IPMA suggests investigating awareness and brand-association activities while maintaining quality assurance. CVPAT supports lower prediction loss than IA, with a small aggregate advantage over LM and no significant LM advantage specifically for purchase intention. These findings give managers a basis for designing and testing coordinated content, product, and commerce activities. They do not establish sales gains, cost-effective budget allocations, or SDG achievement.

Design limitations arise from cross-sectional self-reports, the absence of temporal ordering, possible common-method bias, and unmeasured confounders. Statistical indirect paths therefore cannot establish causal mechanisms, and intention may differ from actual behavior. Generalizability is separately constrained by purposive online recruitment and the eligibility requirement of existing game and merchandise familiarity. Non-fans, consumers without comparable online engagement, other countries, and other entertainment brands may exhibit different relationships. Self-reported merchandise familiarity does not verify purchase history or distinguish responses to official, licensed, and fan-made products with sufficient precision to support separate conclusions.

Future studies should extend the item-level measurement evidence reported here by testing measurement invariance, formally comparing indirect effects, and using longitudinal or experimental designs to examine temporal mechanisms. Broader recruitment and comparisons across communities and product categories would assess transferability, while transaction data would connect intention with behavior. Price fairness, authenticity perceptions, and fan identification warrant direct measurement rather than inference. For digital entertainment and technology innovation management, the specific contribution is a testable account of how brand awareness, quality evaluations, and associations relate to physical merchandise consideration, with clear

limits on causal, predictive, and organizational claims.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: DW and SS; Methodology: TG; Software: SS and DW; Validation: SS and TG; Formal Analysis: TG and DW; Investigation: SS; Resources: TG; Data Curation: DW; Writing Original Draft Preparation: DW and SS; Writing Review and Editing: SS and DW; Visualization: DW. All authors, DW, SS, and TG, have read and agreed to the published version of the manuscript.

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