

Phyigital Retail Experience and Customer Loyalty in Indonesian Fashion Retail: The Sequential Roles of Perceived Value and Customer Satisfaction across Customer Journey Directions

Arief Rahman^{*1}, Mila Suntika², Reni³, Nafiz Annas⁴

^{1,2,3,4}Politeknik PGRI Banten, Indonesia

*e-mail: arief@politeknikpgribanten.ac.id¹, mila@politeknikpgribanten.ac.id²,
reni8511@gmail.com³, nafiz@politeknikpgribanten.ac.id⁴

(Received: August 03, 2026; Revised: September 28, 2026; Accepted: October 09, 2026)

ABSTRACT

This study examines the relationship between Phyigital Retail Experience and Customer Loyalty through Perceived Value and Customer Satisfaction, while investigating differences between digital-to-physical (D2P) and physical-to-digital (P2D) customer journeys in Indonesian fashion retail. Data from a three-wave time-lagged survey involving 503 adult consumers were analysed using partial least squares structural equation modelling, mediation analysis, and multi-group comparisons. The findings indicate that Phyigital Retail Experience is most strongly associated with Perceived Value, whereas Customer Satisfaction exhibits the strongest direct relationship with Customer Loyalty. Significant indirect associations were identified through Perceived Value and Customer Satisfaction, including a statistically significant sequential pathway consistent with the proposed evaluative framework. However, because satisfaction and loyalty were measured concurrently in the final wave, these findings support statistical mediation rather than establishing a causal or fully time-ordered psychological process. Multi-group analysis revealed that the relationship between Phyigital Retail Experience and Perceived Value was stronger for D2P journeys, while the relationship between Customer Satisfaction and Customer Loyalty was stronger for P2D journeys. These findings highlight the relevance of consumer evaluations and customer journey direction in understanding reported loyalty intentions within integrated retail environments. From a managerial perspective, the results emphasise the importance of seamless channel transitions, consistent information, and service continuity across physical and digital touchpoints. The findings concern self-reported loyalty intentions rather than independently observed purchasing behaviour.

Keywords: Phyigital retail experience; perceived value; customer satisfaction; customer loyalty; customer journey; fashion retail

1. INTRODUCTION

The transformation of fashion retailing has increasingly blurred the boundaries between physical and digital shopping environments, fundamentally reshaping how consumers interact with retailers throughout their purchasing journeys. In Indonesia, this transformation coincides with the rapid expansion of digital consumption, as reflected in the 14.26 billion digital payment transactions recorded in the fourth quarter of 2025, representing a 39.21% year-on-year increase (Bank Indonesia, 2026). Nevertheless, the growing prominence of digital channels has not diminished the importance of physical stores, particularly in fashion retailing, where product evaluation frequently requires sensory inspection, fitting, and interpersonal assistance. Consumers increasingly combine these complementary environments, moving from digital product discovery to in-store evaluation or from physical encounters to online transactions and post-purchase services. Such interactions suggest that retail experiences are no longer confined to individual channels but emerge through interconnected touchpoints that collectively shape consumer evaluations (Lemon & Verhoef, 2016). Consequently, the strategic challenge for fashion retailers extends beyond providing multiple purchasing channels to ensuring that transitions between them deliver coherent and meaningful customer experiences.

This evolving retail landscape has stimulated growing scholarly interest in phygital retailing, which places particular emphasis on the experiential convergence of physical and digital environments. Although omnichannel retailing generally emphasises the coordination and integration of multiple channels, phygital retailing foregrounds how consumers experience these environments as an interconnected continuum. Batat (2024) conceptualises phygital customer experience as an integrated form of interaction in which physical and digital boundaries become progressively less distinguishable. From this perspective, Phygital Retail Experience (PRE) reflects the perceived quality of physical-digital integration, particularly in terms of seamlessness, cross-channel consistency, interactivity, and personalisation. These characteristics are especially relevant to fashion retailing because consumers frequently depend on digital information while continuing to value tangible product encounters. However, technological integration does not necessarily produce favourable consumer evaluations, as inconsistencies in product information, pricing, inventory, or service delivery may undermine the continuity of the shopping experience. Accordingly, understanding phygital retailing requires attention not only to technological integration but also to how consumers evaluate the benefits arising from interconnected touchpoints (Mele et al., 2023).

Existing empirical research provides substantial evidence that integrated retail experiences are associated with favourable consumer outcomes, although the underlying evaluative mechanisms remain incompletely understood across different contexts. In Indonesian fashion retailing, Hamdani et al. (2023) examined the relevance of omnichannel configurations for marketing performance, highlighting the strategic importance of coordinated customer interactions. Similarly, Kembau et al. (2024) identified positive relationships between digital integration, cross-channel consistency, interactivity, and customer satisfaction within the Indonesian retail context. Internationally, Cotarelo et al. (2021) demonstrated the importance of omnichannel shopping value for satisfaction and loyalty, while Mishra et al. (2023) connected phygital experiences with consumer retention through empowerment and satisfaction. These findings collectively establish the relevance of integrated shopping environments for consumer relationships. Nevertheless, much of this evidence concentrates on individual evaluative outcomes or broader mediation mechanisms, leaving room for a more focused examination of how consumers progressively translate perceived integration quality into value judgments, satisfaction, and loyalty within a specific retail setting.

A particularly important development in this literature is the growing recognition that phygital experience may influence loyalty through multiple interconnected psychological mechanisms. Selvendran et al. (2026), for example, investigated a multi-mediated model among Generation Z consumers in Sri Lanka, incorporating customer engagement, perceived value, and satisfaction in explaining the relationship between phygital experience and loyalty. This contribution demonstrates that sequential evaluative mechanisms are not entirely unexplored in phygital research. However, its broader mediation structure and consumer context leave opportunities to examine the specific value-satisfaction sequence among Indonesian fashion consumers and to determine whether particular structural relationships vary according to the order in which physical and digital touchpoints are encountered. This distinction is theoretically consequential because consumers do not necessarily evaluate integrated retail experiences in the same way when their shopping journeys begin through different environments. The remaining research gap therefore concerns not simply whether phygital experiences are associated with loyalty, but how their evaluative pathways operate and whether the strength of these relationships depends on customer-journey direction.

The Stimulus-Organism-Response (SOR) framework provides a theoretical foundation for addressing this issue by explaining how environmental stimuli are associated with behavioural responses through consumers' internal evaluations. Within this framework, PRE represents the stimulus arising from integrated retail interactions, whereas Perceived Value (PV) and Customer Satisfaction (CS) represent distinct organism-level evaluations. Customer Loyalty (CL) constitutes the relational response, reflected in continued retailer preference, repurchase intentions, positive

recommendations, and resistance to switching. The distinction between PV and CS is particularly important because these constructs capture different aspects of consumers' evaluations. PV concerns the perceived balance between benefits and sacrifices, including monetary costs, time, effort, and uncertainty, whereas CS reflects a broader assessment of how satisfactorily the overall shopping experience meets consumer expectations. Previous research has established meaningful associations between customer-perceived value, satisfaction, and favourable behavioural outcomes (Blut et al., 2024). Applying the SOR framework to phygital retailing therefore enables a more differentiated explanation of how integrated shopping experiences are associated with enduring consumer relationships.

Within this theoretical structure, the relationship between phygital experience and loyalty can be understood through a sequence of interconnected evaluations rather than as an exclusively direct association. Seamless channel transitions, accurate information transfer, responsive service, and personalised interactions may enhance perceived value by reducing the effort and uncertainty involved in navigating physical and digital environments. These benefits can subsequently contribute to customer satisfaction when consumers evaluate the overall shopping experience favourably. Satisfaction, in turn, provides an important evaluative basis for sustained retailer preference and future purchasing intentions. This interpretation is consistent with research demonstrating the relevance of shopping value and channel integration for customer satisfaction and loyalty (Huré et al., 2017; Cotarelo et al., 2021; Lazaris et al., 2021). Importantly, the proposed sequence does not imply that value and satisfaction are interchangeable or that loyalty necessarily develops through a single pathway. Rather, it recognises that phygital experience may be associated with loyalty through direct relationships, separate indirect pathways, and an ordered value-satisfaction mechanism. Distinguishing these relationships provides a more precise account of the evaluative processes connecting integrated retail experiences with customer loyalty.

Although this evaluative mechanism offers a coherent explanation of loyalty formation, its relationships may not operate with equivalent strength across different customer journeys. Customer-journey research emphasises that consumer evaluations are shaped by the sequence and configuration of touchpoints rather than by isolated interactions alone (Lemon & Verhoef, 2016; Tueanrat et al., 2021). In a digital-to-physical (D2P) journey, consumers initially encounter product information, pricing, promotional offers, or inventory availability through digital interfaces before proceeding to a physical store. The subsequent in-store interaction provides an opportunity to verify information and assess whether the retailer delivers the benefits anticipated during digital exploration. Consequently, the perceived value of phygital integration may be particularly sensitive to the consistency and transferability of information across these environments. When digital expectations are confirmed through physical encounters, consumers may perceive greater reductions in search costs, uncertainty, and decision-making effort. This reasoning suggests that the relationship between PRE and PV may be stronger in D2P journeys because the physical encounter serves as an important verification point for the value of prior digital interactions.

By contrast, physical-to-digital (P2D) journeys begin with an in-store encounter and subsequently extend into digital environments for purchasing, delivery, customer service, or continued engagement. In this configuration, consumers may initially develop product confidence and favourable evaluations through sensory inspection, personal assistance, and direct interaction with the retailer. Subsequent digital touchpoints then provide opportunities to maintain or undermine these evaluations through service continuity, transaction convenience, personalised communication, and post-purchase support. From this perspective, customer satisfaction may become particularly relevant to loyalty because the digital environment facilitates the continuation of a relationship initially established through physical interaction. The satisfaction-loyalty relationship may therefore be stronger in P2D journeys, where favourable evaluations formed during the integrated experience are connected with opportunities for continued digital engagement. Importantly, these directional differences do not necessarily imply

that D2P and P2D consumers follow fundamentally different loyalty-formation processes. Instead, journey direction may operate as a selective boundary condition, altering the relative strength of particular evaluative relationships within an otherwise shared structural mechanism.

Taken together, these considerations reveal an opportunity to advance phygital retail research by integrating sequential consumer evaluations with the directional characteristics of customer journeys. While previous studies have established relationships among omnichannel integration, perceived value, satisfaction, and loyalty, less attention has been devoted to comparing how specific stages of this mechanism operate across D2P and P2D experiences in Indonesian fashion retailing. Addressing this issue is particularly relevant because fashion consumption combines digitally mediated information search with physical product evaluation, creating distinctive opportunities for cross-channel continuity and disruption. Accordingly, the present study examines the relationship between PRE and CL through the sequential roles of PV and CS, while assessing whether selected structural relationships differ according to customer-journey direction. Drawing on a three-wave time-lagged survey of adult fashion consumers in Indonesia, the study applies partial least squares structural equation modelling and multi-group analysis to investigate these associations. The study contributes to the literature by refining the application of SOR to phygital retail experiences, distinguishing sequential evaluative mechanisms from broader mediation models, and identifying journey direction as a theoretically specified boundary condition. From a managerial perspective, the findings offer insights into how retailers can prioritise cross-channel continuity and experience design according to the evaluative requirements of different shopping journeys, rather than relying solely on the expansion of digital infrastructure.

2. METHOD

Research Design and Temporal Structure

This study employed a quantitative explanatory approach using a three-wave time-lagged survey design to examine the relationships among Phygital Retail Experience (PRE), Perceived Value (PV), Customer Satisfaction (CS), and Customer Loyalty (CL) among fashion retail consumers in Indonesia. The research was grounded in the Stimulus-Organism-Response (SOR) framework, which positions PRE as an environmental stimulus, PV and CS as internal evaluative mechanisms, and CL as the relational response. The individual consumer constituted the unit of analysis, while the focal shopping episode provided the context for evaluating physical-digital retail interactions. Customer-journey direction was incorporated as a grouping variable to examine differences between digital-to-physical (D2P) and physical-to-digital (P2D) experiences.

The three-wave measurement structure was designed to introduce temporal separation between the assessment of retail experience and subsequent consumer evaluations. At Time 1 (T1), the survey addressed the focal retailer, customer-journey characteristics, PRE, and relevant consumer information. Time 2 (T2) focused on PV, whereas Time 3 (T3) addressed CS and CL. The original research protocol specified approximately seven days between consecutive waves, although the actual administration dates and realised intervals were not documented in the available manuscript. This design provided a basis for examining theoretically ordered associations while reducing the simultaneous measurement of all focal constructs. Nevertheless, because CS and CL were assessed during the same wave, the design did not establish temporal precedence between these two variables. Accordingly, the sequential mediation model was interpreted as a theoretically specified statistical indirect relationship rather than definitive evidence of causal transmission (Cain et al., 2018; O'Laughlin et al., 2018).

Partial least squares structural equation modelling (PLS-SEM) was used as the principal analytical framework because the proposed model involved a multidimensional higher-order construct, direct and indirect structural relationships, and comparisons between customer-journey groups. The analysis was organised around measurement-model assessment, structural-

model evaluation, mediation analysis, and multi-group comparisons. This approach was consistent with established methodological applications of PLS-SEM to complex explanatory models involving reflective and formative measurement specifications (Hair et al., 2019, 2020).

Population, Sampling, and Participant Characteristics

The target population comprised adult consumers of fashion retailers operating in Indonesia who had interacted with both physical and official digital touchpoints of the same retailer. The retail context encompassed apparel, footwear, bags, and fashion accessories, where consumers frequently combine digital information search with physical product evaluation. The eligibility framework required participants to be Indonesian residents aged at least 18 years, have experienced an identifiable shopping episode involving both a physical store and an official digital touchpoint of the same retailer, and be able to determine the initiating channel of that episode. Official digital touchpoints included retailer-operated websites, mobile applications, and verified official marketplace or social-commerce accounts. The original manuscript contained inconsistent retrospective eligibility periods, specifying 30 days in the Methods and six months in the Introduction. Consequently, a definitive recall threshold could not be established from the available documentation.

A purposive sampling strategy was specified because participation depended on identifiable cross-channel shopping experiences rather than general fashion consumption. The recruitment framework identified online consumer panels, fashion-shopping communities, university and professional networks, and targeted social-media distribution as potential recruitment channels. However, the available research documentation did not establish the final distribution of participants across these channels. The eligibility criteria excluded shopping experiences confined to a single channel, interactions involving different retailers, and unrelated shopping episodes that could not be classified as one integrated customer journey. Each respondent was associated with one focal retailer and one identifiable shopping episode to maintain consistency across the measurement framework. Given the non-probability sampling approach, the findings were interpreted within the characteristics of the analysed sample rather than as nationally representative estimates.

The original sample-size plan considered statistical power, model complexity, higher-order measurement estimation, and the requirements of multi-group comparison. It reported a preliminary benchmark of approximately 146 observations under assumptions of a medium effect size ($f^2 = 0.15$), a significance level of 0.05, statistical power of 0.95, and up to six predictors. This planning benchmark was not independently verifiable without the original calculation output. The protocol further specified an initial recruitment target of at least 650 eligible respondents and a desired final sample of at least 500 matched observations, allowing for potential losses between measurement waves. These planning figures were distinct from actual recruitment totals, which were not provided in the available documentation. The sample-size strategy was broadly consistent with recommendations to avoid relying exclusively on simplified rules of thumb when determining sample adequacy in PLS-SEM (Kock & Hadaya, 2018).

The final analytical dataset comprised 503 matched responses, including 255 D2P consumers (50.7%) and 248 P2D consumers (49.3%). Female respondents represented 57.5% of the sample, while male respondents accounted for 42.5%. The largest age categories were 21–25 years (34.6%) and 26–30 years (27.2%), indicating that the sample was concentrated among young adult consumers. Regarding purchasing frequency, 47.3% reported purchasing fashion products three to five times during the preceding six months, compared with 29.6% who purchased once or twice and 23.1% who purchased more than five times. The relatively balanced distribution between D2P and P2D respondents supported the subsequent comparison of structural relationships across customer-journey groups. Although the final matched sample was reported, wave-specific recruitment totals and attrition statistics were not available for independent assessment of longitudinal retention.

Customer-Journey Classification

Customer-journey direction was operationalised according to the sequence of physical and digital interactions within the focal shopping episode. D2P journeys referred to experiences initiated through a purposeful digital interaction with the retailer and subsequently continued in a physical store. Such experiences included online product discovery, inventory checking, price comparison, promotional information searches, and digital reservations followed by in-store inspection, fitting, collection, or purchasing. In contrast, P2D journeys began with an in-store encounter and subsequently continued through an official digital touchpoint for additional information, transaction completion, delivery arrangements, customer service, or post-purchase interaction.

The classification framework focused on the initiating purposeful touchpoint rather than consumers' general preferences for physical or digital shopping. For journeys involving several transitions between environments, the initial meaningful interaction within the focal purchase-decision episode provided the conceptual basis for classification. The original instrument framework also specified a behavioural sequence checklist and a validation question intended to improve classification consistency. The final wording and administration of these screening items were not available for independent verification. Journey direction was therefore conceptualised as an observed behavioural grouping variable rather than a psychological characteristic measured through reflective indicators.

This distinction was relevant to the study's theoretical framework because the sequence of customer interactions may affect how integrated retail experiences are evaluated. D2P journeys involve the transition from digitally generated expectations to physical verification, potentially increasing the importance of information accuracy and cross-channel continuity for perceived value. Conversely, P2D journeys involve the extension of store-based evaluations into digital environments, where transaction convenience, service continuity, and post-purchase engagement may become more relevant to the relationship between satisfaction and loyalty. Accordingly, the D2P and P2D classifications provided the basis for examining theoretically specified differences in structural relationships without assuming that both groups followed entirely different evaluative mechanisms.

Measurement Instruments and Construct Operationalisation

The measurement framework incorporated constructs derived from established research on phygital retailing, omnichannel customer experience, perceived shopping value, customer satisfaction, and customer loyalty. The original instrument specification adopted a seven-point Likert-type response scale ranging from 1 (strongly disagree) to 7 (strongly agree). Measurement was organised around consumers' evaluations of one focal retailer and shopping episode to maintain conceptual consistency across constructs and survey waves.

PRE was specified as a reflective-formative higher-order construct representing consumers' overall perceptions of physical-digital retail integration. Four reflective lower-order dimensions constituted the broader construct: seamlessness and continuity, cross-channel consistency, interactivity and responsiveness, and personalisation. Seamlessness and continuity captured the perceived ease of moving between channels without interruption or unnecessary repetition. Cross-channel consistency reflected the alignment of product information, pricing, promotions, and service conditions across physical and digital environments. Interactivity and responsiveness represented the retailer's capacity to facilitate meaningful interactions and respond to consumer needs, while personalisation captured the relevance of information, services, and interactions to individual preferences. The construct specification was informed by previous research on omnichannel integration quality and phygital customer experiences (Hossain et al., 2019; Rodríguez-Torrico et al., 2020; Rahman et al., 2022; Banik & Gao, 2023).

PV represented consumers' overall assessment of the benefits obtained from an integrated shopping journey relative to the monetary and non-monetary sacrifices required. These evaluations encompassed convenience, time expenditure, search effort, coordination

across touchpoints, and perceived uncertainty. Drawing on omnichannel shopping-value research, PV was conceptualised as a cognitive evaluation of the overall worth of the focal retail experience (Huré et al., 2017; Cotarelo et al., 2021). It was distinguished from PRE because integration quality describes the characteristics of the experienced retail environment, whereas perceived value concerns consumers' evaluations of the benefits and sacrifices associated with that environment.

CS was operationalised as a reflective construct representing consumers' overall post-experience evaluation of the focal retailer and shopping journey. Its conceptualisation included the perceived fulfilment of expectations, satisfaction with retailer performance, and favourable overall assessments of the integrated shopping experience (Lazaris et al., 2021; Rodríguez-Torrico et al., 2020). CL was also specified as a reflective construct, capturing continued retailer preference, repurchase intention, positive recommendation, and resistance to switching when alternative retailers were available (Gao & Huang, 2021; Tyrväinen et al., 2020). These constructs were differentiated to examine perceived value, overall satisfaction, and relationship-maintenance intentions as related but conceptually distinct components of the proposed explanatory framework.

Table 1. Measurement Constructs and Temporal Architecture

Construct / Information	Measurement Specification	Primary Sources	Wave
Journey Sequence and Retailer Profile	Observed behavioural grouping variable and respondent characteristics	Study-specific behavioural screening framework	T1
Phygital Retail Experience (PRE)	Reflective-formative higher-order construct comprising seamlessness and continuity, cross-channel consistency, interactivity and responsiveness, and personalisation	Rahman et al. (2022); Rodríguez-Torrico et al. (2020); Hossain et al. (2019); Banik & Gao (2023)	T1
Perceived Value (PV)	Reflective construct; first mediator	Huré et al. (2017); Cotarelo et al. (2021)	T2
Customer Satisfaction (CS)	Reflective construct; second mediator	Lazaris et al. (2021); Rodríguez-Torrico et al. (2020)	T3
Customer Loyalty (CL)	Reflective construct; dependent variable	Gao & Huang (2021); Tyrväinen et al. (2020)	T3

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3. PRE = Phygital Retail Experience; PV = Perceived Value; CS = Customer Satisfaction; CL = Customer Loyalty. The table summarises the measurement structure described in the research protocol.

The original instrument-development framework specified expert review, translation, cognitive interviews, and pilot testing as procedures for strengthening measurement quality. These included a proposed review by six experts, forward and backward translation, cognitive interviews with approximately 8–10 eligible consumers, and pilot assessment involving approximately 50 respondents. However, the available research materials did not document the completion or outcomes of these procedures. Consequently, they were treated as elements of the original instrument-development plan rather than verified implementation. The measurement-model results provided evidence of reliability and validity for the retained constructs, but the final questionnaire items and item-level adaptation history were not available in the supplied manuscript.

Three-Wave Data Collection and Response Matching

The survey architecture separated the measurement of the focal retail experience from subsequent consumer evaluations. T1 was designated for eligibility screening, focal-retailer identification, journey-direction classification, PRE measurement, and respondent-shopping characteristics. T2 focused on PV, enabling respondents to evaluate the benefits and sacrifices associated with the previously identified shopping episode. T3 assessed CS and CL as downstream evaluations of the same focal retailer. The original protocol specified approximately seven-day intervals between successive waves, although actual wave dates and individual response intervals were not reported.

The original data-collection procedure proposed unique participant codes for matching responses across measurement waves. It also described the separate handling of follow-up contact information and substantive survey responses to reduce direct identification within the analytical dataset. Follow-up invitations and reminder messages were included in the proposed retention strategy. However, the implementation records were not provided, preventing independent verification of the precise matching procedure, reminder frequency, and retention process.

The completed Results reported 503 matched cases following the three-wave screening procedure. The analytical sample was therefore interpreted as consisting of respondents represented in the final linked dataset. Nevertheless, the numbers entering and leaving the study at each wave were not available, and response rates, attrition rates, and potential differences between retained and non-retained participants could not be established. This reporting limitation restricts the assessment of possible attrition-related selection bias and should be considered when interpreting the generalisability of the findings.

Measurement Model Assessment

The measurement model was evaluated before interpretation of the structural relationships. For reflective constructs, the reported assessment considered indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability was examined through outer loadings, while Cronbach's alpha and composite reliability were used to assess internal consistency. Convergent validity was evaluated using average variance extracted (AVE), whereas discriminant validity was examined using the heterotrait-monotrait ratio of correlations (HTMT).

The measurement criteria followed established PLS-SEM recommendations, with outer loadings preferably exceeding 0.708, internal consistency coefficients generally exceeding 0.70, and AVE values above 0.50. HTMT values below 0.85 were considered evidence supporting discriminant validity, with 0.90 representing a less conservative threshold for conceptually related constructs (Hair et al., 2019, 2020). Indicator retention was interpreted in relation to both statistical adequacy and the conceptual coverage of each construct. The reported measurement results presented indicator-loading ranges, reliability coefficients, AVE values, and HTMT estimates for the reflective constructs.

The higher-order PRE construct followed a reflective-formative specification, in which four lower-order reflective dimensions jointly represented the broader quality of physical-digital integration. The original analytical strategy specified a two-stage estimation approach for this model (Sarstedt et al., 2019). In the first stage, the reflective lower-order constructs were to be estimated using their respective measurement indicators to obtain latent variable scores. In the second stage, these scores were to serve as formative indicators of the higher-order PRE construct. This distinction is important because reliability and convergent-validity criteria apply to the reflective measurement components, whereas the formative specification requires consideration of collinearity and the contribution of each constituent dimension.

The reported higher-order assessment included variance inflation factors (VIFs), formative outer weights, and their associated significance statistics. VIF values were used to examine whether the lower-order dimensions displayed problematic collinearity, while the

formative weights indicated their relative contributions to PRE. The reported output showed positive and statistically significant weights for seamlessness and continuity, cross-channel consistency, interactivity and responsiveness, and personalisation. Although these results were consistent with the specified reflective-formative structure, the available documentation did not independently establish the software operations used to implement the two-stage estimation. Accordingly, the interpretation was restricted to the reported measurement properties rather than unsupported claims regarding additional estimation procedures.

Structural Model and Mediation Analysis

The structural model was examined to evaluate the hypothesised relationships among PRE, PV, CS, and CL. Six direct relationships were specified, connecting PRE with PV, CS, and CL; PV with CS and CL; and CS with CL. The reported structural evaluation included standardised path coefficients, *t* statistics, *p* values, effect sizes (f^2), and coefficients of determination (R^2). These statistics were used to assess the direction, magnitude, and statistical significance of the structural associations, together with the explanatory capacity of the model for the endogenous constructs.

Mediation analysis was conducted to examine whether PV and CS statistically accounted for the relationship between PRE and CL. Three specific indirect pathways were evaluated: PRE → PV → CL, PRE → CS → CL, and PRE → PV → CS → CL. The first two pathways represented separate indirect associations through PV and CS, whereas the third reflected the theoretically ordered evaluative sequence from perceived value to satisfaction and subsequently to loyalty. The analysis assessed specific indirect effects through bootstrap-based statistical inference and confidence intervals, rather than relying solely on the significance of individual component paths. Direct and indirect effects were interpreted jointly to determine whether the reported relationships were consistent with partial or indirect-only mediation patterns.

The original statistical analysis plan specified 10,000 bootstrap subsamples, two-tailed hypothesis testing at a significance level of 0.05, and bias-corrected confidence intervals. The available Results documented bootstrap-related inferential statistics and confidence intervals for the indirect effects, although the complete resampling settings were not independently available. Consequently, the statistical interpretation was based on the reported coefficients and confidence intervals without introducing additional unverified estimation settings.

The temporal interpretation of mediation required particular attention because CS and CL were measured during the same final wave. Although the three-wave structure separated PRE at T1 from PV at T2, the proposed CS → CL relationship was assessed concurrently at T3. The serial indirect pathway was therefore interpreted as a statistically supported association consistent with the theoretical ordering of the constructs, rather than proof that satisfaction temporally preceded loyalty. In addition, the observational nature of the research prevented definitive causal attribution because unmeasured confounding and alternative directional explanations could not be ruled out. These considerations were reflected in the interpretation of the direct and indirect relationships.

Measurement Invariance and Multi-Group Analysis

Measurement invariance was considered before comparing the structural relationships between D2P and P2D consumers. This assessment was relevant because differences in structural coefficients can be interpreted meaningfully only when the measurement properties of the constructs are sufficiently comparable across groups. The original analytical framework specified the measurement invariance of composite models (MICOM) procedure, which evaluates configural invariance, compositional invariance, and the equality of composite means and variances (Henseler et al., 2016). The reported Results stated that partial measurement invariance was established, although the individual invariance statistics and permutation results were not included in the available output.

Following the reported invariance assessment, PLS multi-group analysis was conducted to compare the structural relationships between D2P and P2D respondents. The analysis involved

255 D2P consumers and 248 P2D consumers, with group-specific path coefficients compared through between-group differences and associated significance tests. This approach distinguished statistically supported differences in path strength from differences arising merely because a relationship reached statistical significance in one group but not in the other.

The comparison focused on whether customer-journey direction altered the relative importance of particular relationships within the shared PRE-PV-CS-CL framework. The PRE → PV relationship was theoretically relevant to D2P journeys because consumers could evaluate the consistency between digital information and subsequent physical encounters. Conversely, the CS → CL relationship was particularly relevant to P2D journeys because digital touchpoints provided opportunities to maintain the favourable evaluations established during store interactions. The remaining structural relationships were also included in the multi-group comparison, allowing the analysis to distinguish selective structural differences from broader differences in the explanatory model. Journey direction was therefore examined as a potential boundary condition affecting particular evaluative associations rather than as evidence of separate loyalty-formation systems.

Data Quality and Ethical Considerations

Data quality was considered through the reported screening of the final matched dataset and the measurement-model assessment. The original research protocol identified eligibility verification, consistency of journey classification, duplicate-response screening, response-pattern inspection, and completion-time checks as potential quality-control procedures. However, the available documentation did not specify which procedures were implemented, their operational thresholds, or the corresponding exclusion counts. Therefore, the analytical sample was described using the verified final case count, without attributing participant exclusions to procedures whose implementation could not be established.

The multi-wave measurement structure was intended to reduce some sources of common-method bias by separating the assessment of PRE, PV, and downstream evaluations. Nevertheless, temporal separation does not eliminate common-method concerns arising from self-reported measures, particularly when CS and CL are assessed concurrently. The original protocol also proposed supplementary common-method diagnostics based on full-collinearity VIFs and construct correlations (Fuller et al., 2016; Kock, 2017). Because the relevant diagnostic outputs were not available, these procedures were not treated as independently verified findings.

The original research protocol described informed consent, voluntary participation, participant-specific codes, and separation of identifying contact information from substantive questionnaire responses as intended ethical safeguards. However, the documentation available for this manuscript did not establish the institutional ethics review status, an approval or exemption reference, or the actual implementation of each proposed procedure. Accordingly, no formal ethical approval or exemption was asserted without supporting documentation.

The methodological interpretation also recognised limitations associated with the non-probability sampling framework, incomplete recruitment-flow reporting, and the concurrent measurement of CS and CL. These limitations did not invalidate the reported statistical associations but restricted claims concerning population representativeness, longitudinal selection processes, and causal ordering. The findings were consequently interpreted as evidence of relationships among integrated retail experiences, consumer evaluations, and loyalty intentions within the observed sample, with customer-journey direction providing a basis for examining structural heterogeneity.

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics and Data Screening

The final analytical sample comprised 503 matched responses retained from the reported three-wave survey of fashion retail consumers in Indonesia. Of these respondents, 255 (50.7%) were classified as digital-to-physical (D2P) consumers, while 248 (49.3%) were classified as physical-to-digital (P2D) consumers. The relatively balanced group sizes provided an appropriate numerical basis for comparing structural relationships across customer-journey directions. However, numerical balance alone does not establish the comparability of measurement properties or other respondent characteristics across groups. The detailed demographic composition of the analytical sample is presented in Table 2.

Table 2. Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	214	42.5
	Female	289	57.5
Age	18–20 years	69	13.7
	21–25 years	174	34.6
	26–30 years	137	27.2
	31–35 years	76	15.1
	>35 years	47	9.3
Journey direction	Digital-to-Physical	255	50.7
	Physical-to-Digital	248	49.3
Purchase frequency	1–2 times	149	29.6
	3–5 times	238	47.3
	>5 times	116	23.1

Note. N = 503. Purchase frequency refers to the preceding six months, as reported in the respondent characteristics. Percentages may not total exactly 100% because of rounding.

The sample was predominantly composed of young adult consumers, with respondents aged 21–30 years accounting for 61.8% of the analytical sample. Female participants represented 57.5%, whereas male participants accounted for 42.5%. Regarding purchase frequency, the largest proportion of respondents (47.3%) reported purchasing fashion products three to five times during the preceding six months. These characteristics provide relevant contextual information for interpreting consumer evaluations of integrated retail experiences. Nevertheless, the concentration of respondents within younger age categories limits the extent to which the findings can be generalised to older fashion consumers.

Although the manuscript reported 503 matched observations following data screening, the available documentation did not include wave-specific recruitment totals, participant exclusions, or longitudinal attrition statistics. Consequently, response rates, retention rates, and potential differences between participants who completed all waves and those who discontinued participation could not be evaluated from the reported information. These details are necessary for a complete assessment of potential attrition-related selection bias. [AUTHOR CONFIRMATION REQUIRED: Provide verified participant-flow counts and attrition analysis if available.]

3.2 Measurement Model Assessment

The measurement model was evaluated to examine the reliability and validity of the reflective constructs and the reported formative specification of Phygital Retail Experience (PRE). For the reflective measurement components, indicator loadings ranged from 0.731 to 0.892, exceeding the commonly recommended threshold of 0.708. Cronbach's alpha values were above

0.70, while composite reliability values ranged from 0.873 to 0.936, indicating satisfactory internal consistency. Average variance extracted (AVE) values ranged from 0.579 to 0.767, exceeding the minimum criterion of 0.50 and supporting convergent validity for the reported reflective measures. The available measurement statistics are summarised in Table 3.

Table 3. Measurement Model Assessment

Panel A. Reliability and Convergent Validity

Construct	Loading range	Cronbach's α	CR	AVE
PRE dimensions	0.731–0.884	0.821–0.889	0.873–0.918	0.579–0.691
Perceived Value	0.796–0.887	0.884	0.920	0.742
Customer Satisfaction	0.813–0.892	0.897	0.929	0.767
Customer Loyalty	0.781–0.886	0.914	0.936	0.744

Panel B. HTMT Matrix

Construct	PRE	PV	CS	CL
PRE	—			
PV	0.721	—		
CS	0.684	0.778	—	
CL	0.622	0.691	0.811	—

Note. PRE = Phygital Retail Experience; PV = Perceived Value; CS = Customer Satisfaction; CL = Customer Loyalty; CR = Composite Reliability; AVE = Average Variance Extracted; HTMT = Heterotrait-Monotrait Ratio. The reliability and AVE values for PRE dimensions represent ranges across the four reflective lower-order dimensions rather than reliability estimates for the formative higher-order construct.

Discriminant validity was examined using the reported HTMT statistics. All values were below the conservative threshold of 0.85, with the highest association observed between CS and CL (HTMT = 0.811). The results therefore supported the empirical distinction among the reported construct measures under the applied criteria. The relatively high CS–CL association was theoretically plausible because satisfaction and loyalty represent related consumer evaluations, although they retain distinct conceptual meanings. Importantly, HTMT findings involving the higher-order PRE composite should be interpreted in conjunction with its formative measurement specification rather than treated as sufficient evidence of formative construct validity. The full item-level results and first-order measurement estimates remain necessary for a comprehensive assessment of the higher-order measurement model.

The higher-order PRE construct was specified through four reflective lower-order dimensions: seamlessness and continuity, cross-channel consistency, interactivity and responsiveness, and personalisation. Because these dimensions jointly formed the broader PRE construct, the formative assessment focused on collinearity and dimension contributions rather than conventional internal consistency criteria. As reported in Table 4, VIF values ranged from 1.74 to 2.31, indicating no substantial collinearity among the four dimensions under commonly applied assessment criteria. All formative outer weights were positive and statistically significant, supporting the reported contribution of each dimension to the higher-order construct.

Table 4. Higher-Order Phygital Retail Experience Assessment

Dimension	Outer weight	t	p	VIF
Seamlessness and Continuity	0.361	7.842	<0.001	2.18
Cross-Channel Consistency	0.298	6.514	<0.001	2.31
Interactivity and Responsiveness	0.214	4.937	<0.001	1.74
Personalisation	0.276	5.886	<0.001	1.96

Note. Outer weights represent the estimated contributions of the reflective lower-order dimensions to the formative higher-order PRE construct.

Among the four dimensions, seamlessness and continuity exhibited the largest formative weight (0.361), followed by cross-channel consistency (0.298), personalisation (0.276), and interactivity and responsiveness (0.214). This configuration suggests that seamlessness and continuity made the largest relative contribution to the operationalisation of PRE in the estimated measurement model. Nevertheless, formative weights should not be interpreted as direct evidence that one dimension produces larger changes in customer satisfaction or loyalty, because such outcome-specific effects were not separately estimated. Although the reported statistics were consistent with the proposed higher-order measurement structure, verification of the first-stage and second-stage estimation outputs remains necessary to establish the actual implementation of the two-stage approach.

3.3 Structural Model and Direct Relationships

The structural model was assessed to examine the proposed relationships among PRE, Perceived Value (PV), Customer Satisfaction (CS), and Customer Loyalty (CL). The reported coefficients of determination indicated that the model accounted for 35.1% of the variance in PV ($R^2 = 0.351$), 52.7% in CS ($R^2 = 0.527$), and 61.8% in CL ($R^2 = 0.618$). These values describe the explanatory performance reported for the respective endogenous constructs and should not be interpreted as evidence of causal explanation. The estimated direct relationships, statistical significance levels, and effect sizes are presented in Table 5.

Table 5. Structural Model Results and Explained Variance

Hyp.	Structural path	β	t	p	f^2	R^2	Decision
H1	PRE $\rightarrow$ PV	0.592	15.684	<0.001	0.541	0.351	Supported
H2	PRE $\rightarrow$ CS	0.214	4.672	<0.001	0.071	0.527	Supported
H3	PRE $\rightarrow$ CL	0.118	2.521	0.012	0.026	0.618	Supported
H4	PV $\rightarrow$ CS	0.538	12.947	<0.001	0.362	—	Supported
H5	PV $\rightarrow$ CL	0.187	3.984	<0.001	0.058	—	Supported
H6	CS $\rightarrow$ CL	0.447	9.836	<0.001	0.247	—	Supported

Note. β = Standardised Path Coefficient; f^2 = Effect Size; R^2 = Coefficient of Determination. R^2 values are displayed once for each endogenous construct. The numerical estimates are retained from the original manuscript and require reconciliation with the complete final model output, particularly for CS and CL.

All six reported direct relationships were positive and statistically significant at the 0.05 level, providing support for H1–H6 under the reported testing criteria. PRE exhibited its strongest direct association with PV ($\beta = 0.592$, $p < 0.001$), accompanied by the largest reported effect size ($f^2 = 0.541$). Its associations with CS ($\beta = 0.214$, $p < 0.001$) and CL ($\beta = 0.118$, $p = 0.012$) were smaller in magnitude. The latter relationship also exhibited a comparatively small effect size ($f^2 = 0.026$), indicating that statistical significance should not be interpreted as evidence of a substantial direct contribution to loyalty.

PV was positively associated with CS ($\beta = 0.538$, $p < 0.001$; $f^2 = 0.362$) and CL ($\beta = 0.187$, $p < 0.001$; $f^2 = 0.058$). These findings indicated that perceived value was more strongly related to satisfaction than directly to loyalty within the estimated structural model. Among the reported predictors of CL, CS had the largest standardised direct coefficient ($\beta = 0.447$, $p < 0.001$), with an effect size of $f^2 = 0.247$. This pattern was consistent with a model in which integrated retail experience relates more strongly to initial value appraisal, whereas satisfaction represents a comparatively strong proximal correlate of loyalty. However, differences in coefficient magnitudes should not be interpreted as statistically significant contrasts unless formally tested.

Taken together, the direct-path results were consistent with the proposed SOR structure. The comparatively strong PRE–PV and PV–CS relationships suggested that consumers' evaluations of integrated retail environments were associated with perceptions of value and overall satisfaction. The smaller direct PRE–CL association indicated that the relationship between phygital experience and loyalty was not fully captured by a direct pathway alone. These results provided a basis for examining the specific indirect associations involving PV and CS.

3.4 Mediation Analysis

The mediation analysis evaluated whether PV and CS statistically accounted for the association between PRE and CL. Three specific indirect pathways were examined, including separate pathways through PV and CS and a theoretically ordered pathway involving both constructs. As presented in Table 6, all three indirect associations were positive and statistically significant, with confidence intervals excluding zero.

Table 6. Specific Indirect Effects

Hypothesis and indirect path	β	t	p	95% CI	Decision
H7: PRE → PV → CL	0.111	3.76 1	<0.001	[0.058, 0.169]	Supported
H8: PRE → CS → CL	0.096	4.10 6	<0.001	[0.054, 0.145]	Supported
H9: PRE → PV → CS → CL	0.142	6.48 2	<0.001	[0.101, 0.188]	Supported

Note. β = Standardised Specific Indirect Effect; CI = Confidence Interval. The reported confidence intervals and significance statistics are retained from the original manuscript.

The indirect association between PRE and CL through PV was positive and statistically significant ($\beta = 0.111$, $p < 0.001$; 95% CI [0.058, 0.169]), supporting H7. A significant indirect association was also observed through CS ($\beta = 0.096$, $p < 0.001$; 95% CI [0.054, 0.145]), supporting H8. The theoretically ordered pathway PRE → PV → CS → CL likewise showed a significant indirect association ($\beta = 0.142$, $p < 0.001$; 95% CI [0.101, 0.188]), supporting H9. Although the serial pathway had the largest numerical indirect-effect estimate, its superiority over the two simpler indirect pathways was not separately tested. Therefore, the findings support the presence of multiple statistically significant indirect associations without establishing that one pathway is statistically stronger than another.

The continued statistical significance of the direct PRE–CL relationship alongside the indirect associations was consistent with partial statistical mediation under the specified model. This pattern indicated that PV and CS accounted for identifiable indirect components of the association between phygital experience and loyalty, while a smaller direct relationship remained. The total effect was not separately reported in the available output and was therefore not introduced as an independently verified estimate.

Importantly, the interpretation of the serial indirect pathway was constrained by the measurement design. PRE and PV were assigned to T1 and T2, respectively, whereas CS and CL were both measured at T3. Consequently, the reported indirect effect represented a statistical pattern consistent with the proposed theoretical ordering but did not demonstrate that satisfaction temporally preceded loyalty. Moreover, the observational design did not exclude alternative causal explanations or unmeasured confounding. The mediation findings therefore provide evidence consistent with the proposed evaluative mechanism rather than definitive proof of a sequential causal process.

3.5 Multi-Group Analysis Across Customer-Journey Directions

Multi-group analysis was used to examine whether the structural relationships differed between D2P and P2D customer journeys. The original manuscript reported that partial

measurement invariance had been established before the comparison of structural coefficients. However, the detailed measurement-invariance statistics, including the underlying MICOM assessment, were not available in the reported results. Therefore, the interpretation of between-group differences remains conditional on verification that the required level of measurement comparability was achieved. [AUTHOR CONFIRMATION REQUIRED: Provide complete measurement-invariance output and the implemented MGA inference settings.]

The reported PLS-MGA results, presented in Table 7, identified statistically significant differences in two of the six structural relationships. The PRE → PV coefficient was stronger among D2P consumers ($\beta = 0.653$) than among P2D consumers ($\beta = 0.526$), with a between-group difference of $\Delta\beta = 0.127$ ($p = 0.029$). Conversely, the CS → CL coefficient was stronger among P2D consumers ($\beta = 0.501$) than among D2P consumers ($\beta = 0.392$), with $\Delta\beta = -0.109$ ($p = 0.041$). These findings were consistent with the proposed role of customer-journey direction as a potential boundary condition affecting selected evaluative relationships.

Table 7. Multi-Group Analysis: Digital-to-Physical versus Physical-to-Digital Journeys

Structural path	β D2P	β P2D	$\Delta\beta$	MGA p
PRE → PV	0.653	0.526	0.127	0.029
PRE → CS	0.231	0.194	0.037	0.438
PRE → CL	0.126	0.107	0.019	0.672
PV → CS	0.566	0.509	0.057	0.284
PV → CL	0.204	0.168	0.036	0.397
CS → CL	0.392	0.501	-0.109	0.041

Note. D2P = Digital-to-Physical ($n = 255$); P2D = Physical-to-Digital ($n = 248$). $\Delta\beta = \beta$ D2P – β P2D. MGA p denotes the reported significance level for the between-group coefficient difference.

In contrast, the remaining four structural comparisons did not provide statistically significant evidence of between-group differences. These included PRE → CS ($\Delta\beta = 0.037$, $p = 0.438$), PRE → CL ($\Delta\beta = 0.019$, $p = 0.672$), PV → CS ($\Delta\beta = 0.057$, $p = 0.284$), and PV → CL ($\Delta\beta = 0.036$, $p = 0.397$). Although the corresponding coefficient estimates varied numerically, the available evidence was insufficient to conclude that their population-level relationships differed according to customer-journey direction. These non-significant comparisons should not be interpreted as demonstrating that the relationships were identical across groups.

Overall, the reported MGA identified selective structural heterogeneity associated with journey direction, particularly in the PRE–PV and CS–CL relationships. However, the available MGA table contained only direct-path comparisons and did not report group-specific serial indirect effects or a formal test of their difference. Consequently, the reported findings do not establish whether the complete PRE → PV → CS → CL indirect pathway differs significantly between D2P and P2D consumers. This distinction is important when interpreting the theoretical implications of journey direction.

Discussion

Phygital Retail Experience and the Formation of Perceived Value

The findings suggest that the relationship between phygital retail experience and customer loyalty is more strongly associated with consumers' internal evaluations than with the direct association between integrated retail experience and loyalty alone. Within the structural model, PRE exhibited its strongest direct association with PV, while its relationships with satisfaction and loyalty were smaller. This pattern supports the view that technological integration is not inherently valuable simply because a retailer provides multiple connected touchpoints. Rather, its relevance depends on how consumers evaluate the benefits of navigating physical and digital environments as part of a coherent shopping experience. This interpretation

is consistent with Batat's (2024) conceptualisation of phygital experience as an experiential continuum and with research emphasising the importance of channel integration and service continuity for customer evaluations (Hossain et al., 2019; Quach et al., 2022).

The observed relationship between PRE and PV is particularly relevant to fashion retailing because consumers often combine informational efficiency with physical product evaluation. Digital channels facilitate product discovery, comparison, and access to retail information, whereas physical stores allow consumers to examine quality, fit, and other sensory attributes that may be difficult to assess remotely. When these environments are experienced as coherent, the integrated journey may reduce perceived effort and uncertainty while increasing convenience and decision confidence. Conversely, inconsistent information or disconnected services may diminish the value of integration despite the availability of sophisticated retail technologies. Rahman et al. (2022) similarly conceptualise omnichannel customer experience as multidimensional, suggesting that favourable evaluations depend on the quality of interconnected retail interactions rather than on channel availability alone.

The formative higher-order measurement results provide additional insight into the composition of PRE. Seamlessness and continuity exhibited the largest reported formative contribution, followed by cross-channel consistency, personalisation, and interactivity and responsiveness. This pattern is compatible with research emphasising seamless customer interactions and the importance of connecting retail touchpoints (Lazaris et al., 2021; Rodríguez-Torrico et al., 2020). It also complements studies identifying memorable encounters and technology-supported experiences as relevant elements of phygital retailing (Banik, 2021; Bonfanti et al., 2023). Nevertheless, the measurement results establish relative contributions to the PRE composite rather than independently demonstrating which specific dimensions have the greatest associations with loyalty. Their theoretical significance therefore lies in clarifying the multidimensional configuration of the focal experience construct.

The comparatively small direct association between PRE and CL further qualifies the interpretation of technological integration as a source of relational value. Although the direct relationship was statistically significant, its modest magnitude indicates that integration quality alone captured a relatively limited direct component of loyalty variation in the estimated model. This finding is broadly consistent with evidence linking omnichannel customer experiences with subsequent evaluations and retention-related outcomes (Kembau et al., 2024; Zhang et al., 2024). Rather than treating loyalty as an automatic consequence of digital transformation, the findings suggest that consumer appraisals are important for understanding why integrated retail experiences are associated with relationship-maintenance intentions. Within the SOR framework, PRE represents the experienced retail environment, while the internal evaluations associated with that environment help explain the observed relationship with loyalty.

Perceived Value, Customer Satisfaction, and the Evaluative Pathway to Loyalty

The mediation findings provide further support for distinguishing perceived value and customer satisfaction as related but conceptually separate evaluations. All three specific indirect pathways were statistically significant, indicating that the association between PRE and CL was consistent with mechanisms involving PV, CS, and their theoretically ordered combination. The serial pathway had the largest numerical estimate among the reported indirect effects, although the analysis did not establish that this difference was statistically significant. Accordingly, the central theoretical contribution is not the superiority of one mediation pathway, but the identification of multiple evaluative associations connecting integrated retail experience with loyalty. This distinction is important because it avoids reducing consumer evaluations to a single undifferentiated psychological response.

The relatively strong PV-CS relationship is consistent with the proposition that consumers' assessments of benefits and sacrifices are closely related to their overall evaluations of the shopping experience. A phygital journey may offer convenience through online inventory information, digital reservations, integrated payments, or flexible fulfilment options. However,

these features are likely to be evaluated favourably only when their perceived benefits justify the time, cost, effort, and uncertainty involved. The findings are compatible with Huré et al. (2017), who identify shopping value as a relevant component of omnichannel retail experiences, and Cotarelo et al. (2021), who establish relationships among omnichannel shopping value, satisfaction, and loyalty. The broader association between customer-perceived value and favourable consumer outcomes is also supported by the meta-analysis of Blut et al. (2024).

Although perceived value and satisfaction were positively related, their conceptual distinction remains important for interpreting the mediation model. PV reflects consumers' assessments of what they obtain relative to what they sacrifice, whereas CS represents a broader post-experience evaluation of retailer performance and expectation fulfilment. Consumers may recognise the practical benefits of integrated retail services while remaining dissatisfied with particular aspects of their experience, such as inaccurate product information, inconsistent promotional conditions, or unsatisfactory fulfilment. Conversely, a favourable shopping experience may involve dimensions of satisfaction that extend beyond a narrow assessment of functional value. The reported associations are therefore consistent with differentiating value appraisal from overall satisfaction within the organism component of the SOR framework, although the study does not establish the causal ordering of these evaluations.

The CS-CL relationship further highlights the relevance of overall consumer evaluations to retailer preference and continued purchasing intentions. Satisfaction exhibited the largest direct coefficient among the reported predictors of loyalty, suggesting that it was an important proximal correlate of relationship-maintenance intentions within the estimated model. This finding is compatible with previous research linking customer experience, channel integration, engagement, and favourable retail evaluations with loyalty-related outcomes (Gao & Huang, 2021; Lee et al., 2019; Tyrväinen et al., 2020; Yin et al., 2022). Nevertheless, loyalty in the present study was conceptualised through intentions and preferences rather than independently observed long-term purchasing behaviour. Therefore, the findings should not be interpreted as demonstrating actual customer retention over time.

The present results also provide a focused complement to the multi-mediated phygital loyalty model examined by Selvendran et al. (2026). Whereas that study incorporated engagement alongside perceived value and satisfaction among Generation Z consumers in Sri Lanka, the present research concentrated on the value-satisfaction relationship within Indonesian fashion retailing. Its contribution lies in examining the specified evaluative relationships while incorporating customer-journey direction as an additional source of potential structural heterogeneity. This contextual and relational refinement is more defensible than claiming that sequential mediation itself is entirely novel. At the same time, the concurrent measurement of satisfaction and loyalty means that the findings support a theoretically ordered statistical pathway rather than a fully observed temporal process.

Customer-Journey Direction as a Selective Boundary Condition

The multi-group findings suggest that customer-journey direction may be associated with differences in particular relationships within the proposed SOR framework. Two of the six structural comparisons were statistically significant, whereas the remaining four did not provide sufficient evidence of between-group differences. This pattern is more consistent with selective structural heterogeneity than with fundamentally different explanatory models for D2P and P2D consumers. The distinction is theoretically important because physical and digital touchpoints may contribute different functions depending on their sequence within the shopping journey. Customer-journey research similarly emphasises that consumer evaluations depend on how successive interactions are configured and interpreted (Lemon & Verhoef, 2016; Tueanrat et al., 2021).

The stronger PRE-PV relationship among D2P consumers suggests that the perceived quality of integration may be particularly relevant to value appraisal when digital interactions precede physical encounters. Consumers beginning their journeys digitally may form

expectations concerning product availability, prices, promotions, sizes, or service conditions before entering a store. Their subsequent physical encounter provides an opportunity to assess whether information obtained through digital interfaces remains accurate and useful. Under this interpretation, integrated retail experience becomes especially relevant to perceived value when the transition from digital exploration to physical evaluation supports task continuity and reduces uncertainty. This explanation is consistent with the conceptualisation of phygital journeys as interconnected systems of information and engagement (Mele & Russo Spena, 2022).

The D2P pattern also corresponds with research describing phygital journeys as combinations of resources and experiences distributed across physical and digital environments. Mele et al. (2021) identify emotional, behavioural, and social dimensions of phygital customer journeys, while Mele et al. (2024) highlight the practices through which consumers combine resources across touchpoints. These perspectives suggest that the value of cross-channel integration may depend on how effectively earlier interactions support subsequent shopping activities. In fashion retailing, the ability to verify digitally identified products through physical inspection provides a plausible explanation for the stronger PRE–PV association in D2P journeys. However, information verification and expectation confirmation were not independently tested as mediators in the present study. They should therefore be regarded as theoretically plausible interpretations rather than directly demonstrated explanations of the observed group difference.

A contrasting pattern emerged for the CS–CL relationship, which was stronger among P2D consumers. When the customer journey begins in a physical store, consumers may initially evaluate products through sensory inspection, personal assistance, and direct interaction with retail personnel. Subsequent digital encounters may then provide opportunities to maintain this experience through convenient purchasing, personalised communication, delivery, or post-purchase services. Within this configuration, favourable satisfaction evaluations may be more closely associated with intentions to continue the retailer relationship because the digital channel extends engagement beyond the original physical encounter. The reported MGA supports a difference in the strength of the satisfaction-loyalty association, although it does not directly establish the psychological mechanism responsible for that difference.

This interpretation extends previous Indonesian retail research by introducing a more specific comparison of how customer evaluations relate to loyalty across different journey sequences. Hamdani et al. (2023) demonstrate the strategic relevance of omnichannel configurations in Indonesian fashion retailing, while Kembau et al. (2024) examine digital integration and customer satisfaction in the Indonesian retail context. The present study adds that the PRE–PV and CS–CL relationships were not equivalent across the two journey-direction groups under the reported MGA. These findings are also compatible with broader research suggesting that customer-journey design and integration quality are relevant to consumer-brand relationships (Zheng & Li, 2024). However, the observed relationships should not be interpreted as evidence that journey direction was experimentally manipulated or that switching the order of retail touchpoints would necessarily produce corresponding changes in value or loyalty.

The non-significant comparisons are equally important for delimiting the proposed boundary condition. No statistically significant group differences were reported for PRE–CS, PRE–CL, PV–CS, or PV–CL. These findings indicate that the available evidence does not support a general claim that every relationship within the explanatory model varies according to journey direction. They also do not establish equivalence between groups, because a non-significant difference may reflect limited sensitivity to detect smaller contrasts. Consequently, customer-journey direction should be interpreted as a potential selective boundary condition affecting particular structural associations. Furthermore, the absence of a reported between-group test for the complete serial indirect pathway prevents conclusions regarding whether the overall mediation mechanism is statistically equivalent across D2P and P2D consumers.

Theoretical Contributions and Managerial Implications

The study contributes to phygital and omnichannel research by clarifying the relationships among integrated retail experience, perceived value, satisfaction, and loyalty within an Indonesian fashion-retail context. First, the comparatively strong PRE–PV relationship supports the relevance of value appraisal in understanding consumer responses to integrated physical-digital environments. Second, the significant indirect associations demonstrate that PV and CS provide distinct statistical pathways connecting phygital experience with loyalty-related intentions. Third, the MGA identifies customer-journey direction as a potential boundary condition associated with differences in selected structural relationships. Together, these findings refine the application of the SOR framework by connecting a multidimensional retail stimulus with distinguishable consumer evaluations and journey-specific structural heterogeneity.

From a theoretical perspective, the findings also suggest that phygital experience should not be equated with the mere availability of digital technologies or multiple retail channels. The formative measurement results indicate that continuity, consistency, interactivity, and personalisation jointly contribute to the operationalisation of the integrated experience. Meanwhile, the structural findings distinguish experience quality from consumers' subsequent appraisals of value and satisfaction. This distinction complements Batat's (2024) conceptualisation of phygital experience and the broader research agenda advanced by Mele et al. (2023). Rather than establishing an entirely new mediation sequence, the study provides a context-specific assessment of how these established constructs are related and where their associations vary across customer-journey configurations.

The managerial implications follow from the observed importance of integrated experience quality and its relationship with perceived value. Fashion retailers may benefit from prioritising continuity between physical and digital touchpoints, particularly in product information, availability, promotional conditions, and transaction processes. For D2P journeys, the stronger PRE–PV association suggests that retailers should pay particular attention to the accuracy and usability of information transferred from digital interfaces to physical stores. Consistent inventory visibility, transparent promotional conditions, and continuity of customer interactions may help reduce friction when consumers move from online exploration to in-store evaluation. These recommendations are consistent with the observed associations but should be treated as managerial implications rather than experimentally validated interventions.

For P2D journeys, the stronger CS–CL relationship suggests that maintaining favourable customer evaluations across the transition from physical stores to digital channels may be particularly relevant to relationship-management strategies. Retailers could therefore prioritise transaction convenience, continuity of customer information, accessible after-sales services, and coherent loyalty benefits across channels. Importantly, the findings do not imply that retailers should design entirely separate online and offline systems or favour one journey direction universally. Rather, they suggest the potential value of maintaining a common integrated retail infrastructure while recognising that different transition points may correspond with different consumer evaluations.

Methodological Limitations and Directions for Future Research

Several limitations should be considered when interpreting these findings. First, although the study reported a three-wave time-lagged design, customer satisfaction and customer loyalty were assessed concurrently during the final wave. This measurement arrangement limits the ability to establish temporal precedence between the second mediator and the outcome. Consequently, the significant serial indirect association cannot be interpreted as definitive evidence of a fully sequential causal mechanism. Future research could measure satisfaction and loyalty at separate time points or employ experimental designs that manipulate specific features of channel integration to strengthen causal interpretation.

Second, the non-probability sampling framework and concentration of respondents within younger age categories limit the generalisability of the findings beyond the analysed

sample. In addition, the absence of complete wave-specific recruitment and attrition information restricts assessment of possible selection processes across survey waves. Future research should document participant flow and longitudinal retention more fully and examine whether the relationships are consistent across age groups, geographic regions, retailer categories, and consumer segments. More diverse sampling strategies would also help establish whether the observed journey-direction differences extend beyond the studied population.

Third, the study relied on self-reported consumer evaluations and loyalty-related intentions. Although separating measurement across waves may reduce some common-method concerns, it does not eliminate shared-method influences, particularly for satisfaction and loyalty measured at the same time. Future studies could integrate transaction records, observed channel-switching behaviour, and longitudinal repurchase data to distinguish reported intentions from subsequent behaviour. Further research could also examine whether information consistency, expectation confirmation, or relationship continuity account for the observed differences between D2P and P2D journeys.

Finally, the interpretation of structural heterogeneity depends on adequate measurement comparability across journey-direction groups. Although partial measurement invariance was reported, the underlying invariance statistics were not available in the supplied results. This limitation reinforces the need for transparent reporting of measurement-invariance procedures and between-group indirect-effect tests. Subsequent research could extend the current model by explicitly assessing whether the complete indirect pathway differs across journey configurations and by examining additional boundary conditions, including retailer type, technology readiness, shopping involvement, and digital-channel ownership. These extensions would help clarify when integrated retail experiences are associated with stronger consumer value evaluations and relationship-maintenance intentions.

4. CONCLUSIONS AND SUGGESTION

This study provides empirical evidence that Phygital Retail Experience (PRE) is positively associated with Customer Loyalty through the evaluative roles of Perceived Value and Customer Satisfaction among Indonesian fashion consumers. PRE demonstrated its strongest direct association with Perceived Value, while Customer Satisfaction emerged as the strongest direct predictor of loyalty. The significant indirect effects were consistent with the proposed sequential evaluative mechanism, contributing to the Stimulus Organism Response (SOR) framework by clarifying how integrated retail experiences relate to consumer evaluations and loyalty intentions. However, these findings represent statistical associations rather than definitive evidence of causal relationships, particularly because satisfaction and loyalty were measured concurrently. The analysis also identified differences across customer journey directions, with the relationship between PRE and Perceived Value being stronger in digital to physical (D2P) journeys, whereas the relationship between Customer Satisfaction and Customer Loyalty was stronger in physical to digital (P2D) journeys. These findings suggest that journey direction may influence the strength of specific relationships within the proposed model.

From a practical perspective, fashion retailers should prioritise seamless integration, consistent information, and service continuity across physical and digital environments. For D2P journeys, greater attention should be directed towards ensuring the accuracy of digital information and its consistency with physical store experiences. For P2D journeys, retailers should strengthen digital service quality, transaction convenience, and customer relationship continuity following store visits. Nevertheless, the observational research design, nonprobability sampling, and simultaneous measurement of satisfaction and loyalty limit causal interpretation and generalisability. Future studies should employ longitudinal designs that measure satisfaction and subsequent loyalty behaviour at separate time points, incorporate actual purchasing and retention data, and use experimental approaches to examine the effects of different customer journey configurations. Further research across industries, consumer segments, and retail

environments would also help establish the consistency of these relationships and clarify the contextual conditions associated with customer loyalty.

REFERENCES

- Banik, S. (2021). Exploring the involvement-patronage link in the phygital retail experiences. *Journal of Retailing and Consumer Services*, 63, 102739. <https://doi.org/10.1016/j.jretconser.2021.102739>
- Banik, S., & Gao, Y. (2023). Exploring the hedonic factors affecting customer experiences in phygital retailing. *Journal of Retailing and Consumer Services*, 70, 103147. <https://doi.org/10.1016/j.jretconser.2022.103147>
- Bank Indonesia. (2026). *Laporan Kebijakan Moneter Triwulan IV 2025*. Bank Indonesia. <https://www.bi.go.id/id/publikasi/laporan/Pages/Laporan-Kebijakan-Moneter-Triwulan-IV-2025.aspx>
- Batat, W. (2024). What does phygital really mean? A conceptual introduction to the phygital customer experience (PH-CX) framework. *Journal of Strategic Marketing*, 32(8), 1220–1243. <https://doi.org/10.1080/0965254X.2022.2059775>
- Blut, M., Chaney, D., Lunardo, R., Mencarelli, R., & Grewal, D. (2024). Customer perceived value: A comprehensive meta-analysis. *Journal of Service Research*, 27(4), 501–524. <https://doi.org/10.1177/10946705231222295>
- Bonfanti, A., Vigolo, V., Vannucci, V., & Brunetti, F. (2023). Creating memorable shopping experiences to meet phygital customers' needs: Evidence from sporting goods stores. *International Journal of Retail & Distribution Management*, 51(13), 81–100. <https://doi.org/10.1108/IJRDM-12-2021-0588>
- Cotarelo, M., Calderón, H., & Fayos, T. (2021). A further approach in omnichannel LSQ, satisfaction and customer loyalty. *International Journal of Retail & Distribution Management*, 49(8), 1133–1153. <https://doi.org/10.1108/IJRDM-01-2020-0013>
- Cotarelo, M., Fayos, T., Calderón, H., & Mollá, A. (2021). Omni-channel intensity and shopping value as key drivers of customer satisfaction and loyalty. *Sustainability*, 13(11), 5961. <https://doi.org/10.3390/su13115961>
- Gao, M., & Huang, L. (2021). Quality of channel integration and customer loyalty in omnichannel retailing: The mediating role of customer engagement and relationship program receptiveness. *Journal of Retailing and Consumer Services*, 63, 102688. <https://doi.org/10.1016/j.jretconser.2021.102688>
- Hamdani, N. A., Mutmainah, A., Maulani, G. A. F., Nugraha, S., & Permana, I. (2023). Omnichannel fashion retail in Indonesia: How it affects marketing performance? *MIX: Jurnal Ilmiah Manajemen*, 13(1), 49–62. https://doi.org/10.22441/jurnal_mix.2023.v13i1.004
- Hossain, T. M. T., Akter, S., Kattiyapornpong, U., & Dwivedi, Y. K. (2019). Multichannel integration quality: A systematic review and agenda for future research. *Journal of Retailing and Consumer Services*, 49, 154–163. <https://doi.org/10.1016/j.jretconser.2019.03.019>
- Huré, E., Picot-Coupey, K., & Ackermann, C.-L. (2017). Understanding omni-channel shopping value: A mixed-method study. *Journal of Retailing and Consumer Services*, 39, 314–330. <https://doi.org/10.1016/j.jretconser.2017.08.011>
- Kembau, A. S., Setiawan, G. H., & Lendo, F. B. (2024). Strategi ritel phygital: Meningkatkan kepuasan pelanggan melalui integrasi teknologi digital dan interaksi media sosial. *Journal of Business & Applied Management*, 17(2), 131–146. <https://doi.org/10.30813/jbam.v17i2.6175>

- Lazaris, C., Sarantopoulos, P., Vrechopoulos, A., & Doukidis, G. (2021). Effects of increased omnichannel integration on customer satisfaction and loyalty intentions. *International Journal of Electronic Commerce*, 25(4), 440–468. <https://doi.org/10.1080/10864415.2021.1967005>
- Lee, Z. W. Y., Chan, T. K. H., Chong, A. Y.-L., & Thadani, D. R. (2019). Customer engagement through omnichannel retailing: The effects of channel integration quality. *Industrial Marketing Management*, 77, 90–101. <https://doi.org/10.1016/j.indmarman.2018.12.004>
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69–96. <https://doi.org/10.1509/jm.15.0420>
- Mele, C., Di Bernardo, I., Ranieri, A., & Russo Spena, T. (2024). Phygital customer journey: A practice-based approach. *Qualitative Market Research: An International Journal*, 27(3), 388–412. <https://doi.org/10.1108/QMR-08-2023-0102>
- Mele, C., & Russo Spena, T. (2022). The architecture of the phygital customer journey: A dynamic interplay between systems of insights and systems of engagement. *European Journal of Marketing*, 56(1), 72–91. <https://doi.org/10.1108/EJM-04-2019-0308>
- Mele, C., Russo Spena, T., Marzullo, M., & Di Bernardo, I. (2023). The phygital transformation: A systematic review and a research agenda. *Italian Journal of Marketing*, 2023(3), 323–349. <https://doi.org/10.1007/s43039-023-00070-7>
- Mele, C., Russo Spena, T., Tregua, M., & Amitrano, C. C. (2021). The millennial customer journey: A phygital mapping of emotional, behavioural, and social experiences. *Journal of Consumer Marketing*, 38(4), 420–433. <https://doi.org/10.1108/JCM-03-2020-3701>
- Mishra, S., Malhotra, G., Chatterjee, R., & Shukla, Y. (2023). Consumer retention through phygital experience in omnichannel retailing: Role of consumer empowerment and satisfaction. *Journal of Strategic Marketing*, 31(4), 749–766. <https://doi.org/10.1080/0965254X.2021.1985594>
- Quach, S., Barari, M., Moudry, D. V., & Quach, K. (2022). Service integration in omnichannel retailing and its impact on customer experience. *Journal of Retailing and Consumer Services*, 65, 102267. <https://doi.org/10.1016/j.jretconser.2020.102267>
- Rahman, S. M., Carlson, J., Gudergan, S. P., Wetzels, M., & Grewal, D. (2022). Perceived Omnichannel Customer Experience (OCX): Concept, measurement, and impact. *Journal of Retailing*, 98(4), 611–632. <https://doi.org/10.1016/j.jretai.2022.03.003>
- Rodríguez-Torrico, P., Trabold Apadula, L., San-Martín, S., & San José Cabezudo, R. (2020). Have an omnichannel seamless interaction experience! Dimensions and effect on consumer satisfaction. *Journal of Marketing Management*, 36(17–18), 1731–1761. <https://doi.org/10.1080/0267257X.2020.1801798>
- Selvendran, M., Salman, S., Lakvidu, D., Dahanayaka, U., Wisenthige, K., & Dayapathirana, N. (2026). Unlocking Gen Z engagement in phygital retailing: Evidence from a multi-mediated customer experience model. *PLOS ONE*, 21(8), e0353490. <https://doi.org/10.1371/journal.pone.0353490>
- Tulebayeva, N. T., Kozhamkulova, Z. T., & Dirsehan, T. (2026). The role of channel integration quality in shaping consumer behavior in omnichannel and multi-channel retail. *Journal of Open Innovation: Technology, Market, and Complexity*, 12(1), 100721. <https://doi.org/10.1016/j.joitmc.2026.100721>
- Tueanrat, Y., Papagiannidis, S., & Alamanos, E. (2021). A conceptual framework of the antecedents of customer journey satisfaction in omnichannel retailing. *Journal of Retailing and Consumer Services*, 61, 102550. <https://doi.org/10.1016/j.jretconser.2021.102550>
- Tyrväinen, O., Karjaluo, H., & Saarijärvi, H. (2020). Personalization and hedonic motivation in creating customer experiences and loyalty in omnichannel retail. *Journal of Retailing and Consumer Services*, 57, 102233. <https://doi.org/10.1016/j.jretconser.2020.102233>

-
- Yin, C.-C., Chiu, H.-C., Hsieh, Y.-C., & Kuo, C.-Y. (2022). How to retain customers in omnichannel retailing: Considering the roles of brand experience and purchase behavior. *Journal of Retailing and Consumer Services*, 69, 103070. <https://doi.org/10.1016/j.jretconser.2022.103070>
- Zhang, X., Park, Y., Park, J., & Zhang, H. (2024). Demonstrating the influencing factors and outcomes of customer experience in omnichannel retail. *Journal of Retailing and Consumer Services*, 77, 103622. <https://doi.org/10.1016/j.jretconser.2023.103622>
- Zheng, L., & Li, Y. (2024). Customer journey design in omnichannel retailing: Examining the effect of autonomy-competence-relatedness in brand relationship building. *Journal of Retailing and Consumer Services*, 78, 103776. <https://doi.org/10.1016/j.jretconser.2024.103776>