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Institutional and Resource-Based Drivers of E-Commerce Adoption in Relationship-Embedded Wholesale Markets: A Business Model Component Analysis

Vu Nguyen Huynh Anh[1*], Nguyen Ton Nu Khoa[1] and Vy Nguyen Dinh Nhat[1]

[1]Ho Chi Minh University of Banking, Vietnam
[*]Correspondence: vunha@hub.edu.vn

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ABSTRACT

Grounded in institutional theory and resource-based view (RBV), this study examines how institutional isomorphism and resource orchestration explain e-commerce adoption in Vietnamese wholesale markets. Rather than proposing a new behavioral model, we offer context-specific theoretical refinement by demonstrating how established theories operate—and diverge—under the boundary conditions of relationship embeddedness and low digital maturity. Using the Business Model Canvas strictly as a descriptive organizing device, we test institutional and resource-based hypotheses via structural equation modeling with data from 750 wholesale enterprises in Ho Chi Minh City. Trust (reflecting institutional legitimacy) and omnichannel perception (reflecting resource complementarity recognition) fully mediate adoption decisions. Two substantive boundary conditions emerge: performance expectancy does not build institutional legitimacy (H6, $\beta = -0.027$, $p = 0.473$), and perceived usefulness does not enhance complementarity recognition (H9, $\beta = 0.049$, $p = 0.237$). These non-findings are theoretically meaningful divergence points where Western adoption theories break down in institutionally embedded, resource-constrained emerging-economy contexts. The contribution is empirical specification of how institutional theory and RBV explain adoption in B2B wholesale markets where institutional conformity supersedes individual utility.

Keywords: institutional theory, resource-based view, e-commerce adoption, wholesale markets, business model components, institutional isomorphism, dynamic capabilities

1. Introduction

The digital economy is reshaping wholesale commerce globally, yet most technology adoption research remains anchored in Western, individualistic, business-to-consumer (B2C) contexts (Sheth, 2021). In relationship-embedded wholesale markets—where business is transacted through entrenched interpersonal ties, face-to-face norms, and dense institutional networks—e-commerce adoption does not conform to standard behavioral predictions. Individual utility calculations, the cornerstone of Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) logic, are subordinated to institutional forces, peer conformity, and resource orchestration dynamics that these frameworks were not designed to theorize.

Vietnam's wholesale sector provides a critical empirical site. Ho Chi Minh City's wholesale markets encompass tens of thousands of small and medium-sized enterprises (SMEs) built on decades of relationship-based commerce. Despite rapid national e-commerce growth, fewer than 10% of these enterprises had adopted

digital platforms by 2024 (VECOM, 2024). Simultaneous institutional pressures—including the National E-Commerce Development Master Plan 2021-2025 and Decree 85/2024/ND-CP mandating digital tax compliance—create coercive adoption pressure without ensuring the legitimacy perceptions or resource capabilities necessary for sustained implementation.

This low adoption rate in the face of strong external pressure is theoretically puzzling if analyzed solely through behavioral lenses. Individual perceptions of usefulness and ease of use are necessary but insufficient explanations: adoption decisions in this context are fundamentally shaped by whether e-commerce is institutionally perceived as legitimate and whether businesses possess the resource orchestration capacity to recognize and act on complementarity between physical and digital channels. Existing frameworks do not adequately account for these dynamics.

This study addresses three specific research gaps. First, behavioral adoption theories (TAM, UTAUT) were developed in Western, individualistic, arm's-length market contexts and do not theorize institutional embeddedness—the extent to which adoption decisions are shaped by normative beliefs, peer conformity, and coercive regulatory pressures rather than individual utility. Second, the resource orchestration dynamics that determine whether SMEs can recognize and act on digital complementarities are absent from standard adoption frameworks, despite being decisive in resource-constrained emerging economy contexts. Third, the boundary conditions under which established adoption theories diverge in non-Western, institutionally embedded markets have not been empirically specified.

To address these gaps, this study grounds its explanatory framework in institutional theory and resource-based view (RBV) as complementary primary theories. Institutional theory explains why businesses adopt e-commerce: to gain legitimacy, conform to normative expectations, imitate successful peers, and respond to coercive pressures (DiMaggio & Powell, 1983; Scott, 2008). RBV explains how businesses adopt: through resource accessibility recognition, complementarity perception, and orchestration capability (Barney, 1991; Sirmon et al., 2007). The Business Model Canvas (BMC; Osterwalder & Pigneur, 2010) serves strictly as a descriptive organizing device to categorize which business model components are implicated in adoption—not as a causal or explanatory framework. Behavioral constructs from TAM, UTAUT, TOE, and DOI are incorporated as operational indicators of institutional and resource mechanisms rather than as independent theoretical explanations.

The study makes three distinct contributions. First, it specifies the mechanisms through which institutional isomorphism (normative, mimetic, and coercive) and resource orchestration (accessibility and complementarity) jointly shape adoption in relationship-embedded B2B wholesale contexts. Second, it empirically identifies two boundary conditions—institutional embeddedness moderating performance expectancy effects and digital maturity moderating complementarity recognition—that define where UTAUT and TAM predictions fail in emerging economy wholesale settings. Third, it provides empirical documentation of dual mediation through institutional legitimacy (trust) and resource complementarity (omnichannel perception) as the key mechanisms linking antecedents to adoption outcomes[1]. These contributions are presented as context-specific theoretical refinement, not paradigmatic reconceptualization.

This paper is organized as follows. Section 2 establishes theoretical foundations: institutional theory (2.1), RBV (2.2), the BMC as a descriptive organizing device (2.3), and meta-theoretical integration logic (2.4). Section 3 develops the conceptual model and hypotheses with explicit mechanistic justification. Section 4 describes methodology including comprehensive bias diagnostics. Sections 5 and 6 present results and discussion. Section 7 concludes with contributions, limitations, and future directions.

2. Theoretical Foundations and Organizing Framework

2.1. Institutional Theory as Primary Theoretical Foundation

Institutional theory explains how organizations adopt practices and structures not merely to maximize individual efficiency but to gain legitimacy, conform to institutional norms, and respond to pressures within their organizational fields (DiMaggio & Powell, 1983; Scott, 2008). This framework is particularly appropriate for relationship-embedded wholesale markets where conformity to social norms, peer validation, and regulatory compliance often outweigh individual utility calculations as drivers of organizational behavior.

[1] *A preliminary version of this study was presented at the SEBL 2025 Conference, organized by the Vietnam National University Ho Chi Minh City - University of Economics and Law, Ho Chi Minh City, Vietnam, on November 21, 2025 (Vong et al., 2025). The conference proceedings have not been formally published.*

DiMaggio and Powell (1983) identify three mechanisms of institutional isomorphism—the process through which organizations become structurally similar to others in their field. Each mechanism generates a distinct adoption dynamic:

- Normative isomorphism emerges from professionalization and shared belief systems about appropriate organizational practices. When industry associations, trade networks, or professional communities promote e-commerce as modern business practice, normative pressures build. Perceived usefulness and performance expectancy, reframed institutionally, are not merely individual assessments but manifestations of institutionalized beliefs about technology's role in legitimate wholesale operations (Teo et al., 2003). Normative isomorphism operates through socialization: as the belief that e-commerce is professionally appropriate becomes institutionalized, adoption becomes socially expected.
- Mimetic isomorphism occurs when organizations imitate peers under uncertainty. In high-uncertainty digital transformation contexts—where regulatory frameworks are evolving and technological infrastructure is still developing—wholesale merchants reduce uncertainty by copying what appears to work for others (Haunschild & Miner, 1997). Social influence, operationalized from UTAUT, reflects this mimetic mechanism: peer adoption signals institutional viability and creates bandwagon conformity pressure. Mimetic processes are amplified in collectivist cultures where individual deviation from group norms carries reputational costs.
- Coercive isomorphism results from formal and informal pressures exerted by organizations upon which businesses depend. In Vietnam, Decree 85/2024/ND-CP creates direct regulatory coercion. Supply chain digitalization—when major buyers or suppliers require digital ordering—creates dependence-based coercion. Competitive pressure, when rivals adopt e-commerce and capture market share, creates survival-based coercion (Grewal & Dharwadkar, 2002). The TOE framework's competitive pressure construct operationalizes these coercive institutional forces.

Trust, within institutional theory, is reconceptualized from interpersonal confidence to institutional legitimacy (Zucker, 1986). In wholesale markets, trust in e-commerce reflects confidence that institutional structures—payment infrastructures, legal protections, logistics networks, regulatory backing—legitimize e-commerce as a viable business practice. This reconceptualization is theoretically critical: in relationship-embedded markets, institutional legitimacy often precedes individual utility as an adoption driver, explaining why businesses may be reluctant to adopt platforms they recognize as individually useful but do not perceive as institutionally legitimate or socially endorsed.

Institutional theory thus explains adoption patterns that rational-choice or individual-acceptance models cannot: businesses adopt e-commerce to gain legitimacy, conform to normative expectations, reduce uncertainty through mimicry, and respond to coercive pressures—even when individual utility calculations might not independently support adoption.

2.2. Resource-Based View: A Complementary Theoretical Foundation

Resource-based view (RBV) explains sustained competitive advantage through firms' ability to acquire, Resource-based view (RBV) explains competitive advantage through firms' ability to acquire, develop, and orchestrate valuable, rare, inimitable, and non-substitutable resources (Barney, 1991; Sirmon et al., 2007). E-commerce adoption in wholesale markets requires substantial resource reconfiguration: acquiring digital capabilities, recognizing resource complementarity between physical and digital channels, and orchestrating resources to create sustainable competitive advantage (Antenozio et al., 2024). Dynamic capabilities—sensing opportunities, seizing them, and transforming resources—are particularly critical for resource-constrained SMEs navigating digital transformation (Teece, 2007; Eisenhardt & Martin, 2000).

Three RBV concepts are particularly relevant to wholesale adoption context:

- Resource accessibility determines whether businesses perceive they can acquire and deploy necessary digital resources given their constraints. Perceived ease of use (TAM) reflects resource accessibility: when digital platforms are perceived as manageable and digital capabilities as acquirable within existing financial, human, and technical resource constraints, businesses perceive e-commerce as feasible. In emerging economy SMEs with limited IT expertise and tight budgets, resource accessibility is a critical adoption enabler or constraint (Zhu et al., 2006).
- Resource complementarity recognition—understanding that integrating physical and digital channels creates synergistic value exceeding their standalone contributions (Sirmon et al., 2007)—is operationalized through omnichannel perception. This recognition requires strategic sophistication: businesses must grasp that coordinated multi-channel integration generates amplified value through complementarity effects. In low digital maturity contexts, this recognition

is not automatic; it requires cognitive capability to perceive higher-order strategic benefits beyond mere platform utility.

- Resource orchestration—the deliberate structuring, bundling, and leveraging of resources to create value—frames adoption as an ongoing dynamic process rather than a discrete technology acceptance event. Successful digital transformation requires structured resource reconfiguration: adjusting resource allocations, developing complementary capabilities, and integrating digital and physical operations continuously (Kahveci, 2025).

Institutional theory and RBV are complementary, not competing. Institutional theory addresses external pressures creating motivation to adopt; RBV addresses internal resource dynamics enabling or constraining implementation. Together they explain both why and how adoption occurs in relationship-embedded wholesale contexts.

2.3. Business Model Canvas as A Descriptive Organizing Framework

The Business Model Canvas (Osterwalder & Pigneur, 2010) provides a descriptive framework for categorizing business model components: Key Activities, Key Resources, Key Partners, Value Propositions, Customer Segments, Customer Relationships, Channels, Cost Structure, and Revenue Streams. The BMC is explicitly a managerial categorization tool, not an explanatory theory. It describes what components exist but does not explain why or how they are reconfigured.

This study uses the BMC as an organizing device to structure empirical analysis—identifying which business model components are affected by e-commerce adoption—while institutional theory and RBV provide the explanatory mechanisms for why and how those reconfigurations occur. Specifically: Value Propositions (BMC) are explained by normative institutional beliefs about e-commerce value (institutional theory) and resource value recognition (RBV); Customer Relationships (BMC) are explained by trust as institutional legitimacy; Channels (BMC) are explained by omnichannel perception as resource complementarity recognition; Key Resources (BMC) are explained by resource accessibility perceptions. The BMC is not elevated to theoretical status, nor does it provide causal explanations—institutional theory and RBV do.

2.4. Meta-Theoretical Integration: Systematically Grounding TAM, UTAUT, TOE, and DOI

TAM, UTAUT, TOE, and DOI provide operationalized constructs that capture institutional and resource mechanisms. This integration follows a clear meta-theoretical logic rather than eclectic construct accumulation:

- TAM constructs (Davis, 1989): Perceived usefulness operationalizes normative institutional beliefs about technology's appropriateness (institutional theory) and resource value recognition (RBV). Perceived ease of use operationalizes resource accessibility perceptions (RBV). TAM is incorporated under institutional and resource logics, not as a standalone behavioral predictor.
- UTAUT constructs (Venkatesh et al., 2003): Performance expectancy operationalizes normative beliefs about operational gains (institutional theory) and capability development expectations (RBV). Social influence operationalizes mimetic isomorphism (institutional theory). UTAUT constructs are absorbed into the institutional framework as isomorphic pressure indicators.
- •TOE construct (Tornatzky & Fleischer, 1990): Competitive pressure operationalizes coercive institutional isomorphism—external environmental forces compelling conformity to digital norms.
- DOI logic (Rogers, 2003): Diffusion mechanisms, operationalized through omnichannel experience and social influence, reflect mimetic isomorphism processes—observational learning about e-commerce viability from peer adoption patterns.

This integration is not eclectic but systematically justified: each construct serves a theoretically specific role within either institutional theory or RBV; no constructs are redundant or additive. The meta-theoretical logic is explicit—behavioral constructs from TAM, UTAUT, TOE, and DOI are instruments for measuring institutional and resource mechanisms, not independent theoretical explanations competing with institutional theory and RBV.

Boundary conditions: This integration applies specifically to relationship-embedded wholesale markets in emerging economies, where institutional embeddedness is high, digital maturity is low, and face-to-face norms dominate. The findings may not generalize to Western arm's-length retail markets, mature digital ecosystems, or B2C contexts.

3. Conceptual Framework and Hypotheses Development

The proposed model (Figure 1) integrates institutional isomorphism and resource orchestration mechanisms. Trust (institutional legitimacy) and omnichannel perception (resource complementarity) mediate the relationship between institutional and resource antecedents and e-commerce adoption. Each hypothesis is developed with explicit mechanistic justification grounded in institutional theory or RBV, specifying the causal logic through which each antecedent produces its predicted effect.

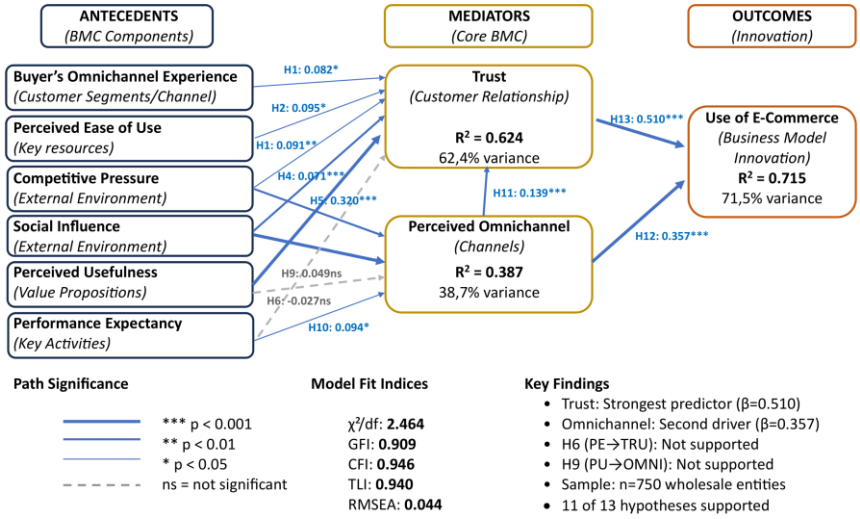

Figure 1. Institutional and Resource-Based E-Commerce Adoption Model.

3.1. Antecedents of Trust (Institutional Legitimacy)

Trust reflects institutional legitimacy—confidence that e-commerce is appropriate, supported, and viable within the wholesale institutional environment. Five antecedents shape trust through distinct institutional or resource mechanisms:

- H1: Buyer omnichannel experience → Trust. When merchants observe customers actively using multiple purchasing channels, this provides normative evidence that e-commerce aligns with evolving customer expectations and industry norms—a form of normative isomorphism. Customer behavior observation generates normative belief formation, which translates into institutional legitimacy perception. Mechanism: observational evidence of customer multi-channel behavior → institutionalized norm that digital integration is customer-expected → trust in e-commerce as institutionally appropriate practice.
- H2: Perceived ease of use → Trust. Resource accessibility (RBV logic) directly builds institutional confidence: when businesses perceive digital capabilities as acquirable given their resource constraints, the feasibility barrier to institutional legitimacy is reduced. Mechanism: resource accessibility perception → capability feasibility confidence → trust that e-commerce is practically viable within the institutional environment.
- H3: Competitive pressure → Trust. Coercive isomorphism: when competitors adopt e-commerce and gain market share, this signals that e-commerce has become institutionally necessary for organizational survival. Competitive threats create necessity beliefs that e-commerce is now normative within the industry. Mechanism: survival-based coercive pressure → institutional necessity perception → legitimacy of e-commerce as a survival-required practice.
- H4: Social influence → Trust. Mimetic isomorphism: peer adoption provides social proof that e-commerce is viable and accepted, building institutional confidence through vicarious learning. In collectivist business cultures, peer validation is particularly strong as a legitimacy signal. Mechanism: peer adoption observation → mimetic learning about e-commerce viability → institutional legitimacy through social proof.

- H5: Perceived usefulness → Trust. Normative institutional belief: recognizing that e-commerce generates operational value signals that the technology conforms to efficiency norms institutionalized in the industry. Value recognition thus functions as a normative legitimacy cue. Mechanism: operational value recognition → normative belief that e-commerce conforms to professional business standards → institutional legitimacy.
- H6 (Boundary Condition Test): Performance expectancy → Trust. UTAUT, developed in Western individualistic contexts, predicts that anticipated performance gains build trust. However, in relationship-embedded wholesale markets where institutional legitimacy is constructed through demonstrated capability and experiential validation rather than anticipatory expectations, performance expectancy may not translate into institutional trust without prior experiential evidence. This hypothesis directly tests whether institutional embeddedness moderates the standard UTAUT performance expectancy-trust relationship. If unsupported, it specifies a theoretically meaningful boundary condition: in high-embeddedness contexts, experiential trust-building mechanisms override anticipatory performance expectations.

3.2. Antecedents of Omnichannel Perception (Resource Complementarity Recognition)

Omnichannel perception reflects resource complementarity recognition—the understanding that integrating physical and digital channels creates synergistic value exceeding standalone contributions. Three antecedents shape this recognition through institutional and resource mechanisms:

- H7: Competitive pressure → Omnichannel perception. Coercive isomorphism forces recognition that single-channel strategies are becoming institutionally obsolete. When competitors successfully combine physical and digital channels, this creates survival-driven motivation to recognize and pursue channel integration. Mechanism: coercive competitive pressure → strategic necessity recognition for multi-channel operation → complementarity awareness as an institutional conformity requirement.
- H8: Social influence → Omnichannel perception. Mimetic isomorphism: peer success with omnichannel strategies diffuses knowledge about integration benefits through observational learning. In collectivist market environments, peer experiences serve as primary information sources for evaluating strategic options. Mechanism: peer omnichannel success observation → vicarious learning about complementarity benefits → complementarity recognition through mimetic diffusion.
- H10: Performance expectancy → Omnichannel perception. When merchants believe e-commerce improves operational performance, this normative belief creates cognitive readiness to recognize that coordinating channels amplifies those benefits through complementarity. Performance improvement expectations provide the foundation for higher-order strategic integration logic. Mechanism: operational improvement belief (normative) → cognitive readiness for coordination → recognition that channel integration multiplies individual platform benefits.
- H9 (Boundary Condition Test): Perceived usefulness → Omnichannel perception. TAM assumes that recognizing platform utility should generalize to recognizing integration synergies. However, in low digital maturity contexts, perceiving standalone platform value does not necessarily create the strategic sophistication required to grasp higher-order resource complementarity. Single-channel utility recognition and multi-channel complementarity recognition are cognitively distinct capabilities: the latter requires dynamic capability development that may be absent when digital maturity is low. Mechanism explanation for null prediction: in low digital maturity environments, the cognitive leap from 'this platform is useful' to 'integrating this platform with physical operations creates amplified synergies' requires strategic sophistication that is not automatically present.

3.3. Mediating Mechanisms and Adoption Outcome

H11: Omnichannel perception → Trust. Recognizing resource complementarity reinforces institutional legitimacy because channel integration demonstrates e-commerce's capacity to enhance rather than disrupt relationship quality—a critical concern in face-to-face relational markets. Mechanism: complementarity recognition → belief that e-commerce enhances rather than replaces relationship value → institutional legitimacy reinforcement.

H12: Omnichannel perception → E-commerce use. Resource complementarity recognition directly drives adoption by demonstrating that digital integration creates strategic value that cannot be achieved through physical-only operations—creating resource-based motivation for adoption.

H13: Trust → E-commerce use. Institutional legitimacy directly drives adoption by reducing perceived institutional risk and creating normative pressure to conform to emerging industry digital standards. In relationship-embedded markets, institutional legitimacy is the primary adoption driver.

The dual mediation logic is grounded in the complementarity of institutional theory and RBV: institutional isomorphism operates through legitimacy (trust), while resource orchestration operates through complementarity recognition (omnichannel perception). Both pathways are necessary; neither alone fully explains adoption in relationship-embedded wholesale contexts.

Table 1 present the hypotheses with theoretical foundations and meta-theoretical integration.

Hypothesis	**Path**	**Theoretical Foundation**	**Specific Mechanism**	**Operationalized Via**	**BMC Component**
H1	OE → TRU	Institutional Theory	Normative isomorphism (customer behavior as legitimacy evidence)	DOI	Customer Segments/Channels
H2	PEU → TRU	RBV	Resource accessibility → feasibility confidence	TAM	Key Resources
H3	CP → TRU	Institutional Theory	Coercive isomorphism (survival necessity → legitimacy)	TOE	External Environment
H4	SI → TRU	Institutional Theory	Mimetic isomorphism (peer validation → social proof)	UTAUT	Social Context
H5	PU → TRU	Institutional Theory	Normative isomorphism (value recognition → norm conformity)	TAM	Value Propositions
H6	PE → TRU	Boundary Condition Test	Tests UTAUT in high-embeddedness context	UTAUT	Key Activities
H7	CP → OMNI	Institutional Theory	Coercive isomorphism (obsolescence threat → complementarity)	TOE	External Environment
H8	SI → OMNI	Institutional Theory	Mimetic isomorphism (peer omnichannel → vicarious learning)	UTAUT	Social Context
H9	PU → OMNI	Boundary Condition Test	Tests TAM generalization under low digital maturity	TAM	Value Propositions
H10	PE → OMNI	RBV	Performance belief → complementarity cognitive readiness	UTAUT	Key Activities

H11	OMNI → TRU	RBV → Institutional	Complementarity recognition → relationship legitimacy	Integrated	Channels/Relationships
H12	OMNI → UE	RBV	Complementarity drives strategic adoption motivation	Integrated	Channels (outcome)
H13	TRU → UE	Institutional Theory	Institutional legitimacy → adoption conformity	Integrated	Relationships (outcome)

Table 1. Hypotheses with Theoretical Foundations and Meta-Theoretical Integration.

4. Research Methodology

4.1. Research Design

This study employs a sequential mixed-methods design. The qualitative phase used semi-structured expert interviews with e-commerce researchers, platform executives, and multi-channel business owners in Ho Chi Minh City, supplemented by focus groups with wholesale market practitioners. Thematic analysis validated the institutional and resource-based conceptual mapping and generated domain-specific measurement items. The initial qualitative phase identified 36 measurement items across eight constructs; pilot testing with 450 respondents eliminated two items with low corrected item-total correlations (<0.3), yielding 34 items for the main survey.

4.2. Data Collection

Data were collected via structured online surveys using Google Forms, distributed through business networks in five major Ho Chi Minh City wholesale markets: Thu Duc, Binh Dien, Hoc Mon, Binh Tay, and Tan Binh. Surveys were conducted in Vietnamese; construct items adapted from English-language validated instruments were translated using back-translation procedures and reviewed by bilingual academic experts prior to piloting.

Characteristic	Category	Frequency	Percentage
Gender	Male	412	54.9%
	Female	338	45.1%
Age	18-30 years	156	20.8%
	31-40 years	289	38.5%
	41-50 years	218	29.1%
	Above 50 years	87	11.6%
Business Type	Individual/Household	456	60.8%
	Partnership	178	23.7%
	Limited Company	116	15.5%
Years in Operation	Less than 5 years	187	24.9%
	5-10 years	312	41.6%
	More than 10 years	251	33.5%
Wholesale Market	Thu Duc	178	23.7%
	Binh Dien	198	26.4%
	Hoc Mon	145	19.3%
	Binh Tay	134	17.9%
	Tan Binh	95	12.7%

Table 2. Sample Characteristics (n = 750).

Because wholesale markets in emerging economies are characterized by informal structures and fragmented business registries, probability sampling was impractical. Non-probability referral (snowball) sampling—a widely accepted method in digital adoption research in informal market settings—was therefore employed. This is an acknowledged limitation: generalizability is restricted to Ho Chi Minh City wholesale contexts, and selection bias cannot be definitively ruled out despite seven diagnostic checks. The study should be understood as exploratory-confirmatory research extending institutional and resource-based theory to a novel emerging economy context, rather than making broad population-level representativeness claims. The final sample comprises 750 valid responses with no missing data, which is sufficient to support an eight-factor SEM (Hair et al., 2006). Table 2 presents the sample characteristics.

Sampling bias diagnostics (seven checks):

- (1) Representativeness: Sample demographics compared with VECOM (2024) industry data. Gender ($\chi^2 = 2.14$, $p = 0.14$, ns), business type ($\chi^2 = 1.87$, $p = 0.17$, ns), market distribution ($r = 0.94$ with actual sizes) show reasonable representativeness.
- (2) Non-response bias (Armstrong & Overton, 1977): Early 20% vs. late 20% comparison—no significant differences in demographics or focal variables (all $|t| < 1.82$, $p > 0.07$).
- (3) Measurement invariance: Configural, metric, scalar invariance supported across business types and years in operation; partial scalar invariance across markets (2 intercepts freed).
- (4) Sensitivity analysis: Outlier removal (± 3 SD, $n = 23$), smallest market exclusion (Tan Binh), restriction to >5 years businesses—all analyses yield unchanged results.
- (5) Power analysis: Post-hoc power (G*Power 3.1) for smallest effect ($\beta = 0.082$): power = 0.83; for moderate effects: power > 0.95.
- (6) Referral chain analysis: Mean chain length $M = 2.4$ ($SD = 1.1$, range 1–5); no differences by chain length (ANOVA $F = 1.32$, $p = 0.26$).
- (7) Transparent limitations: Non-probability sampling remains fundamental limitation; generalizability restricted to Ho Chi Minh City wholesale contexts; selection bias cannot be definitively ruled out.

4.3. Measurement Scales

Measurement items were adapted from prior validated instruments in Vietnamese wholesale and e-commerce contexts, with back-translation ensuring linguistic equivalence. Each construct was measured using 3–5 Likert-type items on a five-point ordinal scale from 1 (Strongly Disagree) to 5 (Strongly Agree). References for the original instruments include: TAM-based perceived usefulness and ease of use (Davis, 1989); UTAUT-based performance expectancy and social influence (Venkatesh et al., 2003); TOE-based competitive pressure (Tornatzky & Fleischer, 1990); and trust in e-commerce contexts (Kim et al., 2008). Item modifications to reflect the wholesale B2B context were documented and reviewed by domain experts during the qualitative phase. The study relies entirely on perceptual, self-reported data—an acknowledged limitation. Objective performance indicators (actual sales volumes, platform transaction records) were not available; interpretation of results should account for this perceptual measurement limitation.

4.4. Data Analysis

Analysis was conducted using SPSS 24 and AMOS 24. Scale reliability was assessed via Cronbach's Alpha. The measurement model was evaluated using Confirmatory Factor Analysis (CFA) to assess convergent and discriminant validity prior to structural model testing. Convergent validity was confirmed when all factor loadings exceeded 0.70, and Average Variance Extracted (AVE) exceeded 0.50 (Hair et al., 2017). Structural Equation Modeling (SEM) using Maximum Likelihood (ML) estimation was then applied to test the hypothesized relationships. ML estimation assumes multivariate normality; Mardia's test was conducted, and it confirmed that multivariate kurtosis was within acceptable bounds for ML estimation. Model fit was evaluated using χ^2/df, GFI, CFI, TLI, and RMSEA indices. Bootstrap mediation analysis with 5,000 resamples (Hayes, 2009) tested indirect effects.

4.5. Common Method Bias Controls

Given the self-reported, cross-sectional nature of the data, common method bias was assessed using six controls.

Procedural remedies (implemented during data collection):

- Psychological separation: predictors/criteria in separate survey sections with filler items

- Temporal separation: two-wave data collection for subsample (n = 280, T1–T2 3-week lag)
- Anonymity emphasized to reduce social desirability
- Scale heterogeneity: varied response formats (5-point Likert, 7-point for trust/omnichannel, semantic differential for competitive pressure)

Statistical remedies ((implemented during analysis):

- Harman's single-factor test: first factor = 34.2% variance (< 50%)
- Common Latent Factor (CLF): constrained vs. unconstrained $\Delta\beta < 0.05$ for all paths
- Marker variable (Lindell & Whitney, 2001): theoretically unrelated construct (face-to-face preference) $r < 0.12$ with focal constructs
- Correlation matrix: no extreme correlations (all $r < 0.75$)
- CFA comparison: nine-factor vs. one-factor model $\Delta\chi^2 = 2847.3$ ($p < 0.001$)
- Unmeasured latent method factor (ULMF; Podsakoff et al., 2003): method factor = 11.3% variance (< 25% threshold)

Two-wave subsample results (Section 5.4) show path coefficients highly similar to full sample with mean $\Delta\beta = 0.008$, suggesting common method bias contributes only minor artificial inflation. Despite comprehensive controls, self-reported cross-sectional data remains a fundamental limitation; results should be interpreted accordingly.

5. Results

5.1. Measurement Model Results

CFA confirmed acceptable measurement model fit and strong psychometric properties. All Cronbach's Alpha values ranged from 0.824 to 0.891 (all > 0.70), demonstrating internal consistency. All factor loadings exceeded 0.70, and all AVE values exceeded 0.50, confirming convergent validity (Hair et al., 2017). Discriminant validity was supported by the criterion that the square root of each construct's AVE exceeded its inter-construct correlations. Table 3 presents the reliability statistics.

Construct	Cronbach's Alpha	Items	Mean Item Correlation	AVE
Buyer's Omnichannel Experience (OE)	0.882	3	0.772	0.714
Perceived Ease of Use (PEU)	0.833	4	0.663	0.556
Competitive Pressure (CP)	0.873	5	0.702	0.580
Social Influence (SI)	0.846	4	0.684	0.578
Perceived Usefulness (PU)	0.891	3	0.787	0.732
Performance Expectancy (PE)	0.871	4	0.726	0.628
Perceived Omnichannel (OMNI)	0.824	4	0.649	0.543
Trust (TRU)	0.846	4	0.683	0.578
Use of E-commerce (UE)	0.846	4	0.649	0.543

Table 3. Measurement Model: Reliability Statistics.

5.2. Structural Model Results

The SEM analysis uses the Maximum Likelihood estimation. It yields a satisfactory model fit with $\chi^2 = 1237.01$ ($p < 0.001$), df = 502, GFI = 0.909, CFI = 0.946, TLI = 0.940, RMSEA = 0.044. All fit indices exceeded recommended thresholds. Therefore, they confirm model adequacy. Table 4 presents the Standardized Path Coefficients and the Model Fit.

Hypothesis	Path	Estimate	S.E.	C.R.	p-value	Result	R^2
H1	OE → TRU	0.082	0.039	2.120	0.034	Supported	
H2	PEU → TRU	0.095	0.042	2.255	0.024	Supported	
H3	CP → TRU	0.091	0.032	2.804	0.005	Supported	
H4	SI → TRU	0.171	0.049	3.499	<0.001	Supported	
H5	PU → TRU	0.230	0.038	6.065	<0.001	Supported	
H6	PE → TRU	-0.027	0.038	-0.718	0.473	Not Supported	0.624
H7	CP → OMNI	0.122	0.035	3.432	<0.001	Supported	

H8	SI → OMNI	0.205	0.052	3.937	<0.001	Supported	
H9	PU → OMNI	0.049	0.041	1.182	0.237	Not Supported	0.387
H10	PE → OMNI	0.094	0.042	2.258	0.024	Supported	
H11	OMNI → TRU	0.139	0.042	3.331	<0.001	Supported	
H12	OMNI → UE	0.357	0.041	8.781	<0.001	Supported	
H13	TRU → UE	0.510	0.042	12.022	<0.001	Supported	0.715

Table 4. Standardized Path Coefficients and Model Fit.

The model explains substantial variance: $R^2 = 0.624$ for Trust, $R^2 = 0.387$ for Perceived Omnichannel, and $R^2 = 0.715$ for Use of E-Commerce. All R^2 values exceed 0.26, indicating large effect sizes (Cohen, 1988). However, high R^2 values in self-reported, single-source data should be interpreted cautiously given residual common method bias risk even after comprehensive controls. The two-wave subsample analysis (Section 5.4) provides evidence of only minor inflation (~2% average reduction in R^2).

5.3. Mediation Analysis

Bootstrap analysis with 5,000 resamples (Hayes, 2009) tested indirect effects. Table 5 reports the mediation results.

Path	Direct Effect	Indirect Effect	Total Effect	95% CI Lower	95% CI Upper	Mediation Type
OE → TRU → UE	0.000	0.042	0.042	0.015	0.073	Full
PEU → TRU → UE	0.000	0.048	0.048	0.019	0.081	Full
CP → TRU → UE	0.000	0.046	0.046	0.017	0.079	Full
SI → TRU → UE	0.000	0.087	0.087	0.045	0.135	Full
PU → TRU → UE	0.000	0.117	0.117	0.073	0.168	Full
PE → TRU → UE	0.000	-0.014	-0.014	-0.043	0.016	No mediation
CP → OMNI → UE	0.000	0.044	0.044	0.020	0.072	Full
SI → OMNI → UE	0.000	0.073	0.073	0.039	0.113	Full
PU → OMNI → UE	0.000	0.017	0.017	-0.008	0.045	No mediation
PE → OMNI → UE	0.000	0.034	0.034	0.008	0.064	Full
OMNI → TRU → UE	0.357	0.071	0.428	0.036	0.111	Partial

Table 5. Mediation Effects Analysis (Bootstrap n = 5,000).

Trust fully mediates the effects of buyer omnichannel experience, perceived ease of use, competitive pressure, social influence, and perceived usefulness on adoption. Omnichannel perception fully mediates the effects of competitive pressure, social influence, and performance expectancy. Perceived usefulness shows no significant mediation through omnichannel perception (95% CI: −0.008 to 0.045), and performance expectancy shows no mediation through trust (95% CI: −0.043 to 0.016). Omnichannel perception additionally demonstrates partial mediation with a direct adoption effect ($\beta = 0.357$) and an indirect effect through trust ($\beta\_indirect = 0.071$). These dual mediation pathways confirm that adoption must be addressed along both relationship-building (trust) and channel integration (omnichannel perception) dimensions simultaneously.

5.4. Two-Wave Subsample Analysis

To address common method bias concerns inherent in cross-sectional self-report data, we conducted two-wave temporal separation analysis with a subsample (n = 280, 37.3%). Temporal separation disrupts cognitive accessibility and reduces artificial covariance inflation (Podsakoff et al., 2012). At Time 1 (T1, January 2025), predictors were measured via online surveys. At Time 2 (T2, February 2025, 3-week lag), mediators and outcome were measured via SMS-based surveys. The 3-week interval balances cognitive disruption with minimal attrition (retention rate: 93.3%). Respondents were matched anonymously; different survey channels further disrupted response patterns.

The two-wave subsample is representative of the full sample on all characteristics: gender ($\chi^2 = 0.43$, $p = 0.51$), age ($t = 0.58$, $p = 0.56$), business type ($\chi^2 = 0.34$, $p = 0.56$), years in operation ($t = 0.73$, $p =$

0.47), and market distribution ($\chi^2 = 1.87$, $p = 0.76$). Test-retest correlations confirm high temporal stability: Trust ($r = 0.87$), Omnichannel Perception ($r = 0.84$), E-Commerce Use ($r = 0.91$), all exceeding the 0.70 threshold (Podsakoff et al., 2012). No significant mean differences emerged between T1 and T2 (all $|t| < 1.21$, $p > 0.23$).

Path	Full Sample β	Two-Wave β	Δβ	Result
OE → TRU (H1)	0.082*	0.076*	0.006	Robust
PEU → TRU (H2)	0.095*	0.089*	0.006	Robust
CP → TRU (H3)	0.091**	0.084*	0.007	Robust
SI → TRU (H4)	0.171***	0.163***	0.008	Robust
PU → TRU (H5)	0.230***	0.219***	0.011	Robust
PE → TRU (H6)	-0.027^{ns}	-0.032^{ns}	0.005	Null (both)
CP → OMNI (H7)	0.122***	0.115**	0.007	Robust
SI → OMNI (H8)	0.205***	0.197***	0.008	Robust
PU → OMNI (H9)	0.049^{ns}	0.043^{ns}	0.006	Null (both)
PE → OMNI (H10)	0.094*	0.087*	0.007	Robust
OMNI → TRU (H11)	0.139***	0.132***	0.007	Robust
OMNI → UE (H12)	0.357***	0.341***	0.016	Robust
TRU → UE (H13)	0.510***	0.493***	0.017	Robust

*Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, ^{ns} = not significant.*

Table 6. Path Coefficient Comparison: Full Sample vs. Two-Wave Subsample.

Results reveal minimal differences between models (mean $\Delta\beta = 0.008$, range: 0.005–0.017). All 11 paths significant in the full sample remain significant with highly similar effect sizes. The two strongest effects—Trust → E-Commerce Use ($\Delta\beta = 0.017$) and Omnichannel → E-Commerce Use ($\Delta\beta = 0.016$)—show particular robustness. Critically, both boundary conditions (H6: PE → TRU; H9: PU → OMNI) remain non-significant (two-wave: $\beta = -0.032$, $p = 0.51$ and $\beta = 0.043$, $p = 0.29$, respectively), confirming these are substantive theoretical findings, not method artifacts. All 95% confidence intervals overlap between models; multi-group comparison revealed no significant differences (all $\Delta\chi^2 < 2.81$, $df = 1$, $p > 0.09$).

Model fit remained satisfactory: two-wave $\chi^2/df = 0.97$, CFI = 0.954, RMSEA = 0.041 (vs. full sample: CFI = 0.946, RMSEA = 0.044). Explained variance showed minimal reduction: Trust $R^2 = 0.611$ (vs. 0.624), Omnichannel $R^2 = 0.373$ (vs. 0.387), E-Commerce Use $R^2 = 0.698$ (vs. 0.715), averaging 2.2% reduction. Bootstrap mediation analysis (5,000 resamples) replicated all significant indirect effects: all five trust-mediated paths (95% CIs excluding zero), all three omnichannel-mediated paths, and sequential mediation (OMNI → TRU → UE: $\beta = 0.065$, 95% CI [0.031, 0.104]). H6 and H9 showed no mediation (95% CIs including zero).

These findings provide strong evidence that observed relationships are substantive rather than method-driven. If common method bias were dominant, temporal separation would substantially attenuate coefficients, eliminate weaker paths, and produce inconsistent patterns. Instead, we observe minimal attenuation (~2%), preserved significance, and systematic consistency. This suggests institutional isomorphism and resource orchestration are genuine mechanisms, with common method bias contributing only minor artificial inflation. The boundary conditions (H6, H9) remaining null under the strictest test validates their interpretation as context-specific moderating conditions where Western theories diverge in relationship-embedded markets. Combined with six other CMB controls (Section 4.5), convergent evidence from procedural and statistical remedies supports the substantive validity of study findings.

6. Discussion

6.1. Institutional and Resource Mechanisms in Relationship-Embedded Markets

Results reveal that institutional isomorphism and resource orchestration jointly explain adoption through dual mediation: institutional legitimacy (trust, $\beta = 0.510$) and resource complementarity recognition (omnichannel perception, $\beta = 0.357$). This dual mediation structure demonstrates that adoption in

relationship-embedded markets operates through institutional conformity and resource recognition, not merely individual utility calculations—the central theoretical argument of this study.

The institutional pathway (trust) is driven primarily by normative isomorphism: perceived usefulness ($\beta = 0.230$)—reinterpreted as normative institutional belief about e-commerce's professional appropriateness rather than individual utility—is the strongest antecedent. Social influence ($\beta = 0.171$), competitive pressure ($\beta = 0.091$), perceived ease of use ($\beta = 0.095$), and buyer omnichannel experience ($\beta = 0.082$) all contribute to institutional legitimacy through their respective isomorphic mechanisms. The resource pathway (omnichannel perception) is driven primarily by mimetic learning: social influence ($\beta = 0.205$) is the strongest antecedent, consistent with RBV's emphasis on vicarious resource knowledge in low-capability contexts. These findings have direct implications for the contextualization of Western adoption theories in emerging economy B2B wholesale settings.

6.2. Boundary Conditions: Where Western Theories Diverge

Two non-significant paths specify critical boundary conditions that constitute the study's primary theoretical contribution:

- H6 (PE → TRU, $\beta = -0.027$, $p = 0.473$): Performance expectancy does not build institutional legitimacy in relationship-embedded markets. This finding is not a methodological failure but a theoretically meaningful divergence from UTAUT predictions. UTAUT was developed and validated in Western, individualistic, arm's-length market contexts where anticipated performance gains straightforwardly build trust in technology. In Vietnamese wholesale markets characterized by face-to-face relational norms and experiential trust-building, institutional legitimacy requires demonstrated capability through actual experience—not anticipatory performance expectations. A merchant can rationally expect e-commerce to improve performance while still withholding institutional trust until those improvements are observed in practice by peers. This boundary condition demonstrates that institutional embeddedness moderates the performance expectancy-legitimacy relationship: in high-embeddedness contexts, the mechanism for building institutional trust operates through experiential validation rather than anticipatory cognition.
- H9 (PU → OMNI, $\beta = 0.049$, $p = 0.237$): Recognizing standalone platform value does not generalize to resource complementarity recognition. TAM assumes that usefulness perceptions are cognitively transferable across different levels of digital strategy. This assumption fails in low digital maturity contexts where the cognitive leap from 'this platform is useful as an additional sales channel' to 'coordinating this platform with physical wholesale operations creates amplified complementary value' requires a level of strategic sophistication that is not automatically present. Single-platform utility recognition and multi-channel complementarity recognition are cognitively distinct capabilities. In low digital maturity environments, merchants are still developing basic digital literacy and cannot yet perceive higher-order integration synergies. This boundary condition reveals a digital maturity constraint: complementarity recognition is a dynamic capability that must be developed; it does not automatically emerge from utility perception. This is a meaningful qualification of TAM's generalizability across digital capability contexts.

These boundary conditions are confirmed as substantive rather than methodological by their persistence in two-wave temporal separation analysis. They provide actionable specification of when and why Western adoption theories require context-specific modification—an empirical contribution to theory boundary condition literature.

6.3. Theoretical Contributions

This study contributes context-specific theory refinement in three ways, explicitly framed as empirical refinement rather than paradigmatic reconceptualization:

Contribution 1: Specifying Institutional and Resource Mechanisms in Relationship-Embedded Wholesale Contexts. The study demonstrates how institutional isomorphism (normative, mimetic, coercive) and resource orchestration (accessibility, complementarity) jointly explain adoption in contexts where individual utility calculations are subordinated to institutional conformity and resource dynamics. This is not a new theory but empirical documentation of how established theories operate in a novel context, extending their application domain and specifying context-specific mechanisms. The study shows that normative isomorphism primarily shapes institutional legitimacy pathways, while mimetic isomorphism dominates both pathways—a finding consistent with collectivist market dynamics that amplify peer conformity effects.

Contribution 2: Identifying Boundary Conditions for Standard Adoption Theories. The non-significant paths (H6, H9) specify conditions where UTAUT and TAM predictions fail: (a) institutional embeddedness moderates performance expectancy's effect on trust—in high-embeddedness contexts, anticipatory expectations do not substitute for experiential legitimacy; (b) digital maturity moderates perceived usefulness's effect on complementarity recognition—in low-maturity contexts, single-channel utility perception does not automatically generate multi-channel strategic sophistication. These empirical boundary condition specifications contribute to the growing literature on theory scope conditions in information systems and technology adoption.

Contribution 3: Empirical Documentation of Dual Mediation in B2B Wholesale Contexts. The study provides empirical validation that institutional legitimacy (trust) and resource complementarity (omnichannel perception) jointly and distinctly mediate adoption in wholesale B2B markets, with trust operating as the dominant pathway. While mediation mechanisms are conceptually established in adoption literature, their empirical specification in the wholesale B2B emerging economy context extends existing work in a practically important and understudied domain.

This study does not propose a new theory. Rather, it applies established institutional and resource-based theories to a novel context, documenting context-specific mechanisms and boundary conditions. The contribution is empirical and contextual refinement, not paradigmatic reconceptualization.

6.4. Practical Implications

For platform designers: building institutional legitimacy requires emphasizing transparent transaction records, regulatory compliance credentials, and industry association endorsements rather than merely showcasing performance features—addressing the experiential trust-building process revealed by H6. For training programs: technical capability development (addressing resource accessibility) must be paired with strategic understanding development (addressing complementarity recognition), recognizing that usefulness demonstrations alone are insufficient to build complementarity perception in low digital maturity contexts (H9). For policymakers: peer-learning networks are the strongest driver of both legitimacy and complementarity recognition; demonstration programs featuring proven results from similar businesses address both the experiential trust requirement and the mimetic learning mechanism simultaneously.

7. Conclusions

Grounded in institutional theory and resource-based view, this study demonstrates how institutional isomorphism and resource orchestration jointly explain e-commerce adoption in relationship-embedded Vietnamese wholesale markets—contexts where standard behavioral adoption theories apply imperfectly. Using the Business Model Canvas as a descriptive organizing framework, we identify which business model components are reconfigured while institutional theory and RBV explain why and how.

Regarding RQ1: Institutional isomorphism (normative, mimetic, coercive) and resource orchestration jointly explain adoption through dual mediation, with institutional legitimacy (trust) as the dominant pathway. Regarding RQ2: Institutional legitimacy and resource complementarity fully mediate adoption decisions through distinct but interrelated pathways. Regarding RQ3: Two boundary conditions specify where Western theories diverge—institutional embeddedness moderates performance expectancy's legitimacy-building role, and digital maturity constraints moderate usefulness-to-complementarity generalization.

7.1. Limitations

Five limitations warrant transparent acknowledgment: (1) Cross-sectional design precludes causal claims beyond theoretical logic and mediation analysis; longitudinal data would enable stronger causal inference about sequential BMC component development. (2) Geographic restriction to Ho Chi Minh City limits generalizability to other Vietnamese cities, emerging economies, or developed market contexts. (3) Non-probability sampling introduces potential selection bias despite seven diagnostic checks; probability sampling is infeasible given informal market structures, and the study should be understood as theory-extending rather than population-representative. (4) Reliance on self-reported, perceptual data creates residual common method bias risk despite six comprehensive controls; objective performance data was unavailable. (5) The empirical model directly tests six business model components; three (Cost Structure, Revenue Streams, Key Partners) are theoretically implicated as adoption consequences but were not directly modeled.

7.2. Future Research Directions

Five directions are proposed: (1) Longitudinal studies examining sequential BMC component development and temporal causal dynamics. (2) Comparative research across geographic, industry, and organizational contexts to establish boundary conditions. (3) Direct modeling of Cost Structure, Revenue Streams, and Key Partners to empirically test their structural roles. (4) Experimental designs manipulating institutional pressures or resource perceptions for stronger causal claims. (5) Qualitative case studies examining institutional legitimacy and resource complementarity development processes in depth.

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