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DISSERTATION

MANAGEMENT OF MARKETING BUSINESS PROCESSES AT REAL ESTATE ENTERPRISES

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The dissertation contains the results of own research.
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ANNOTATION

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The global situation is complex and severe, economic recovery is fraught with uncertainty, and the Chinese economy is facing the triple pressures of demand contraction, supply shocks, and weakening expectations. After three decades of rapid growth, the real estate industry has fully shifted from "scale expansion" to "high-quality development," and the previous model of high debt and high expansion is no longer sustainable. Traditional functional marketing management suffers from serious departmental silos, process fragmentation, inefficient end-to-end response, and a disconnect between strategy and execution, making it unable to adapt to the dynamic and complex market environment. Business Process Management (BPM), as a core methodology for breaking down functional barriers and improving operational efficiency, has become a key pathway for the digital transformation of real estate enterprises. However, the industry currently faces the core pain point of disconnection among the four elements of strategy, process, organization, and technology, lacking a systematic theoretical framework that integrates these four elements and a practically implementable institutional solution validated by rigorous empirical evidence. This study aims to explore a marketing BPM system adapted to the characteristics of the real estate industry through the organic combination of theoretical construction, market diagnosis, empirical testing, and institutional design, proposing process optimization solutions that can dynamically adapt to market changes, thereby enhancing the market competitiveness and long-term development capabilities of real estate enterprises. The research focuses on the systematic optimization of marketing business process management in real estate enterprises, with the core exploration being: During the industry's deep adjustment period, how to solve the inherent dilemmas of traditional marketing management and achieve a two-way improvement in business efficiency and customer value through the

construction of a BPM system driven by both "management + technology." The unique attributes of the real estate industry include high leverage, long cycles, and strong policy sensitivity. These factors determine that its marketing process management cannot directly copy general BPM theories. Instead, it must be localized and contextually adapted based on industry characteristics. Therefore, this study not only systematically elucidates the essential connotation and operational logic of real estate marketing BPM at the theoretical level but also provides enterprises with replicable and verifiable process optimization solutions and management system frameworks at the practical level, helping enterprises achieve high-quality transformation in a complex and volatile market environment. The specific objectives of the research are fourfold: First, to systematically review the theoretical foundations of marketing business process management in real estate enterprises, clarify its economic substance, core constituent elements, and the constraint mechanisms of key industry characteristics on process design, thereby laying a solid theoretical foundation for the research. Second, to conduct a comparative analysis of the development characteristics, fluctuation logic, and structural evolution differences between the Chinese and Ukrainian real estate markets, diagnose the prevalent issues in the implementation of marketing BPM in current real estate enterprises, and construct a comprehensive evaluation system for marketing BPM effectiveness. Third, to build a dynamic optimization model for marketing BPM and an intelligent marketing technology empowerment framework adapted to the real estate industry, clarifying the key operational mechanisms and phased implementation pathways of the model. Fourth, to empirically test the actual effects of the optimization measures through a quasi-experimental design, and based on the verification results, propose an implementable real estate marketing BPM management system. The research primarily employs the literature research method, comparative analysis method, questionnaire survey method, and quasi-experimental research method. Literature research: Systematically review domestic and international research results related to BPM theory and real estate marketing management, clarify the theoretical evolution context and research limitations, and

construct the theoretical analysis framework of this study. Comparative analysis: Reveal the fundamental differences between the Chinese and Ukrainian real estate markets through an in-depth comparison of their core market data. Questionnaire survey: Design and implement customer satisfaction questionnaires to quantitatively evaluate customer experience, providing first-hand data for the verification of process optimization effects. Quasi-experimental research: Select highly matched on-sale projects as the experimental group and control group, use scientific econometric models to strip away external interfering factors, and precisely identify the actual effects of marketing BPM optimization measures. The core conclusion of the research is: The marketing management system of real estate enterprises must achieve the organic integration of the four major elements of strategy, process, organization, and technology; a single technology investment cannot bring about systematic operational improvement. Theoretical and empirical analyses demonstrate that: First, the essence of real estate marketing BPM is the sublation of the traditional labor division theory, with the core being to break down functional barriers, take end-to-end cross-functional processes as the management core, and achieve the synergistic unity of customer value and enterprise value. Second, there are fundamental differences in the development characteristics, fluctuation logic, and core contradictions between the Chinese and Ukrainian real estate markets. Third, current real estate enterprise marketing BPM generally suffers from the core pain point of disconnection among the four elements of strategy, process, organization, and technology, forming a vicious cycle. Fourth, the "management + technology" dual-driven dynamic optimization model constructed in this study has been empirically tested to have significant practical effectiveness, capable of comprehensively improving enterprise marketing operational efficiency and customer satisfaction. Fifth, strategic alignment and organizational assurance are necessary prerequisites for technological measures to be effective; process automation and standardization are the core levers for improving operational quality, and the implementation of digital tools must be accompanied by a complete management institutional system. Based on the above conclusions, the study

proposes five core optimization strategies: First, comprehensively promote the construction of a standardized system for marketing business processes, establishing a multi-level integrated process control framework. Second, construct a cross-departmental collaborative management system with clear rights and responsibilities, and establish a normalized collaborative governance mechanism. Third, improve the management norms for the entire digital marketing process and the data governance system, achieving omni-channel data integration and business collaboration. Fourth, establish a refined full lifecycle management system covering the entire customer home-buying process, and implement differentiated tiered customer management. Fifth, improve the multi-level process performance monitoring and continuous improvement mechanism to achieve a spiral upgrade of process management.

The research indicates that real estate marketing processes are presenting three major evolutionary trends: from information transmission to experience construction, from broad coverage to precise targeting, and from transaction closure to relationship closure. Digital transformation and green development are the two core driving forces for industry upgrading, and the application of intelligent technologies and ESG value communication will become important competitive arenas in the future industry. This study constructs a dynamic optimization model for real estate marketing BPM that integrates the four major elements, addressing the limitation in existing research regarding the lack of a systematic framework and rigorous empirical verification. It forms a set of empirically verified, implementable management system solutions, providing a directly referable construction template for medium-sized regional real estate enterprises deeply engaged in third- and fourth-tier cities. Future research could further expand the sample size for multi-scenario verification, explore the differences in BPM adaptability across different property types, and conduct long-term tracking studies to evaluate the sustained effects of the optimization measures.

Keywords: real estate enterprise, marketing, marketing management, BPM, process optimization, digital marketing, full customer lifecycle management, interdepartmental collaboration, intelligent marketing, performance monitoring,

difference-in-differences model, market competitiveness, business process efficiency, financial stability, internet marketing, engagement, innovation-oriented enterprises, service sector, digitalization, business environment, innovation-oriented enterprise, marketing strategy.

АНОТАЦІЯ

Сяо Ваньсінь. Управління маркетинговими бізнес-процесами на підприємствах нерухомості – Рукопис.

Дисертація на здобуття наукового ступеня доктора філософії за спеціальністю 073 «Менеджмент». Сумський національний аграрний університет, Суми, 2026.

Глобальна ситуація є складною та гострою, економічне відновлення супроводжується невизначеністю, а китайська економіка стикається з трьома тисками: скороченням попиту, шоками пропозиції та ослабленням очікувань. Після трьох десятиліть швидкого зростання галузь нерухомості повністю перейшла від «масштабного розширення» до «високоякісного розвитку», а попередня модель високого боргу та високого розширення більше не є стійкою. Традиційне функціональне управління маркетингом страждає від серйозних відділових бар'єрів, фрагментації процесів, неефективного сквозного реагування та розриву між стратегією та виконанням, що робить його нездатним адаптуватися до динамічного та складного ринкового середовища. Управління бізнес-процесами (BPM) як основна методологія для подолання функціональних бар'єрів та підвищення ефективності операцій стала ключовим шляхом цифрової трансформації підприємств нерухомості. Однак у галузі наразі існує основна проблема розриву між чотирма елементами: стратегією, процесом, організацією та технологією, відсутня систематична теоретична рамка, яка інтегрує ці чотири елементи, та практично реалізоване інституційне рішення, підтверджене суворими емпіричними доказами. Метою цього дослідження є дослідження системи маркетингового BPM, адаптованої до особливостей галузі нерухомості, шляхом органічного поєднання

теоретичного конструювання, ринкової діагностики, емпіричного тестування та інституційного проектування, а також пропозиція рішень щодо оптимізації процесів, які можуть динамічно адаптуватися до ринкових змін, тим самим підвищуючи ринкову конкурентоспроможність та довгострокові можливості розвитку підприємств нерухомості.

Дослідження зосереджене на систематичній оптимізації управління маркетинговими бізнес-процесами на підприємствах нерухомості, а основне дослідження полягає в наступному: під час періоду глибокої корекції галузі як вирішити внутрішні дилеми традиційного управління маркетингом та досягти двостороннього покращення ефективності бізнесу та цінності для клієнтів шляхом побудови системи BPM, що керується одночасно «управлінням + технологіями». Унікальні атрибути галузі нерухомості включають високу левериджність, довгі цикли та високу чутливість до політики. Ці фактори визначають, що управління її маркетинговими процесами не може безпосередньо копіювати загальні теорії BPM. Натомість, воно повинне бути локалізованим та адаптованим до контексту на основі особливостей галузі. Тому це дослідження не лише систематично пояснює сутнісне значення та операційну логіку маркетингового BPM нерухомості на теоретичному рівні, але й надає підприємствам відтворювані та перевірені рішення щодо оптимізації процесів та рамки систем управління на практичному рівні, допомагаючи підприємствам досягти високоякісної трансформації у складному та нестабільному ринковому середовищі.

Конкретні цілі дослідження чотири: По-перше, систематично переглянути теоретичні основи управління маркетинговими бізнес-процесами на підприємствах нерухомості, уточнити їхню економічну сутність, основні складові елементи та механізми обмеження ключових особливостей галузі на проектування процесів, тим самим закласти міцну теоретичну основу для дослідження. По-друге, провести порівняльний аналіз особливостей розвитку, логіки коливань та відмінностей структурної еволюції китайського та українського ринків нерухомості, діагностувати поширені проблеми

впровадження маркетингового BPM на сучасних підприємствах нерухомості та побудувати комплексну систему оцінки ефективності маркетингового BPM. По-третє, побудувати динамічну модель оптимізації маркетингового BPM та рамку інтелектуального маркетингового технологічного надання, адаптовану до галузі нерухомості, уточнити ключові операційні механізми та етапи шляху впровадження моделі. По-четверте, емпірично перевірити реальні ефекти заходів оптимізації за допомогою квазіекспериментального дизайну та на основі результатів перевірки запропонувати реалізовану систему управління маркетинговим BPM нерухомості.

Дослідження в основному використовує метод літературного дослідження, метод порівняльного аналізу, метод анкетного опитування та метод квазіекспериментального дослідження. Літературне дослідження: систематично переглянути вітчизняні та закордонні наукові результати, пов'язані з теорією BPM та управлінням маркетингом нерухомості, уточнити контекст теоретичної еволюції та обмеження досліджень, а також побудувати теоретичну аналітичну рамку цього дослідження. Порівняльний аналіз: виявити фундаментальні відмінності між китайським та українським ринками нерухомості шляхом глибокого порівняння їхніх основних ринкових даних. Анкетне опитування: розробити та провести опитування задоволеності клієнтів для кількісної оцінки досвіду клієнтів, надавши перші дані для перевірки ефектів оптимізації процесів. Квазіекспериментальне дослідження: вибрати добре узгоджені проекти, що реалізуються, як експериментальну та контрольну групи, використовувати наукові економетричні моделі для виключення зовнішніх факторів втручання та точно визначити реальні ефекти заходів оптимізації маркетингового BPM.

Основний висновок дослідження: система управління маркетингом підприємств нерухомості повинна досягти органічної інтеграції чотирьох основних елементів: стратегії, процесу, організації та технології; окреме інвестування в технології не може призвести до системного покращення операцій. Теоретичний та емпіричний аналіз демонструє: По-перше, сутність

маркетингового BPM нерухомості полягає в знятті традиційної теорії поділу праці, а ядро - у подоланні функціональних бар'єрів, прийнятті сквозних міжфункціональних процесів як ядра управління та досягненні синергетичного єдності цінності для клієнта та цінності підприємства. По-друге, існують фундаментальні відмінності в особливостях розвитку, логіці коливань та основних протиріччях між китайським та українським ринками нерухомості. По-третє, сучасний маркетинговий BPM підприємств нерухомості загалом страждає від основної проблеми розриву між чотирма елементами: стратегією, процесом, організацією та технологією, що формує порочне коло. По-четверте, динамічна модель оптимізації з подвійним керуванням «управління + технології», побудована в цьому дослідженні, пройшла емпіричну перевірку та має значну практичну ефективність, здатна комплексно підвищити ефективність маркетингових операцій підприємства та задоволеність клієнтів. По-п'яте, стратегічна узгодженість та організаційне забезпечення є необхідними передумовами ефективності технологічних заходів; автоматизація та стандартизація процесів є основними важелями підвищення якості операцій, а впровадження цифрових інструментів повинне супроводжуватися повною системою управлінських інституцій.

На основі вищезазначених висновків дослідження пропонує п'ять основних стратегій оптимізації: По-перше, комплексно сприяти побудові стандартизованої системи маркетингових бізнес-процесів, створити багаторівневу інтегровану рамку контролю процесів. По-друге, побудувати міжвідділову систему колективного управління з чіткими правами та відповідальністю та встановити нормований механізм колективного управління. По-третє, вдосконалити норми управління всіма цифровими маркетинговими процесами та систему управління даними, досягти інтеграції даних та бізнес-співпраці по всіх каналах. По-четверте, створити детальну систему управління повним життєвим циклом, що охоплює весь процес купівлі житла клієнтом, та впровадити диференційоване рівневе управління клієнтами. По-п'яте, вдосконалити багаторівневий механізм моніторингу

продуктивності процесів та безперервного вдосконалення, досягти спірального підвищення управління процесами.

Дослідження показує, що маркетингові процеси нерухомості демонструють три основні еволюційні тенденції: від передачі інформації до побудови досвіду, від широкого охоплення до точного націлювання та від завершення угоди до завершення відносин. Цифрова трансформація та зелений розвиток є двома основними рушійними силами модернізації галузі, а застосування інтелектуальних технологій та комунікація цінностей ESG стануть важливими конкурентними аренами у майбутній галузі. Це дослідження побудувало динамічну модель оптимізації маркетингового BPM нерухомості, що інтегрує чотири основні елементи, вирішуючи обмеження існуючих досліджень щодо відсутності систематичної рамки та суворої емпіричної перевірки. Воно формує набір перевірених емпірично та реалізованих рішень систем управління, надаючи безпосередньо рекомендований шаблон побудови для середніх регіональних підприємств нерухомості, що глибоко працюють у містах третього та четвертого рівнів. Майбутні дослідження можуть додатково розширити обсяг вибірки для багатосценарної перевірки, дослідити відмінності адаптивності BPM для різних типів нерухомості та провести довгострокові моніторингові дослідження для оцінки стійких ефектів заходів оптимізації.

Ключові слова: підприємство нерухомості, маркетинг, управління маркетингом, BPM, оптимізація процесів, цифровий маркетинг, управління повним життєвим циклом клієнта, міжвідділова співпраця, інтелектуальний маркетинг, моніторинг продуктивності, модель різниці в різницях, ринкова конкурентоспроможність, ефективність бізнес-процесів, фінансова стійкість, інтернет-маркетинг, залучення споживачів, інноваційно орієнтовані підприємства, сфера послуг, діджиталізація, бізнес-середовище, інноваційно-орієнтоване підприємство, маркетингова стратегія.

LIST OF THE PUBLICATIONS

Articles in periodical scientific publications indexed in the Web of Science Core Collection and/or Scopus databases

1. Yang, Y., Xiao, W., Lyshenko, M., & Zhang, Y. (2023). S-model for project cost management in value engineering for construction companies. *Bulletin of the Polish Academy of Sciences*. Technical Sciences, 71(6). *DOI: https://doi.org/10.24425/bpasts.2023.146617 (SCOPUS) (the author collected data and proposed an approach to project cost management in the field of engineering construction methods and real estate).*

Articles in scientific publications included in the list of specialized scientific publications of Ukraine:

2. Lyshenko Marharyta, Yang Yang, Xiao Wanxin. HCX real estate enterprise marketing organization structure optimization. *Market Infrastructure*. 2022. №69. *DOI: https://doi.org/10.32782/infrastruct69-6 (the author identified general patterns of the organizational structure of marketing, analyzed and made a comparative characteristic of the organizational structure model related to the marketing of real estate enterprises, identified the advantages and disadvantages of each model).*

3. Yang Y., Lyshenko M., Wanxin X. Marketing channel models of distribution in real estate companies. *Economy and Society*. 2022. №44. *DOI: https://doi.org/10.32782/2524-0072/2022-44-118 (the author analyzed and researched real estate marketing channels and presented a schematic diagram of direct real estate sales channels and a schematic diagram of sales agency company channels).*

4. Wanxin X., Lyshenko M. Modern concepts, principles and perspectives of business process management in real estate enterprises. *Economy and Society*. 2023. №52. *DOI: https://doi.org/10.32782/2524-0072/2023-52-22 (the author studied concepts and principles of real estate enterprise business process management, analyzed features, core development elements and prevailing management problems*

of real estate business processes, and put forward targeted optimization management suggestions for process improvement).

5. Wanxin X., Lyshenko M. Research on business process reengineeringof real estate enterprises. *Market Infrastructure*. 2023. №75. *DOI: https://doi.org/10.32782/infrastruct75-11 (the author analyzed the background, definition and three core principles of business process reengineering, put forward a six-stage BPR implementation framework for real estate enterprises, and presented schematic business processes covering five core functional departments of real estate firms).*

6. Wanxin X., Lyshenko M. Diagnostics of management of marketing business processes in real estate enterprises. Bulletin of Sumy National Agrarian University. 2024. №1 (97). P. 19-23. *DOI: https://doi.org/10.32782/bsnau.2024.1.4 (the author explored six core links of real estate marketing processes, analyzed multiple existing management challenges including complex market environment and multi-channel sales, and put forward corresponding improvement strategies while attaching relevant schematic diagrams of sales workflow and influencing factors.)*

7. Wanxin X., Lyshenko M. Evaluation and formation of the concept of modeling business processes of sales in real estate enterprises. *Bulletin of Sumy National Agrarian University*. 2025. №4 (104). P.73-79. *DOI: https://doi.org/10.32782/bsnau.2025.4.11 (the author built a three-dimensional real estate sales process modeling framework by combining ARIMA, CRM and BPMN 2.0 technologies covering policy adaptation, categorized customer service and standardized process management, presented relevant comparison tables and flow diagrams, put forward lightweight transformation schemes for small and medium-sized real estate firms and verified the efficiency improvement of the established model via empirical data.)*

Scientific works certifying the approval of the dissertation materials:

8. Yang Yang, Xiao Wanxin. Current situation and development trend of construction real estate marketing in China. *Актуальні проблеми та перспективи розвитку обліку, аналізу та контролю в соціально-орієнтованій системі*

управління підприємством: Матеріали VI Всеукраїнської науково-практичної конференції. Частина 2. м. Полтава, 30 – 31 березня 2023 р. Полтава, 2023 С. 792-793. *(the author collected analytical data and researched trends in real estate sales in China).*

9. Yang Yang, Xiao Wanxin**.** Construction of real estate enterprise sales evaluation system with ahp. Construction of real estate enterprise sales evaluation system with AHP. Materials of the Scientific and Practical Conference of Teachers, Postgraduates and Students of Sumy National Agrarian University (April 25-28, 2023). Sumy. 2023. p. 325. *(the author adopted the AHP method and Zhengzhou field surveys to build a three-layer real estate marketing capacity evaluation system with four secondary criteria and fifteen specific indicators.)*

10. Xiao Wanxin. Analysis of business processes in real estate enterprises. Materials of the Scientific and Practical Conference of Teachers, Postgraduates and Students of Sumy National Agrarian University (April 25-28, 2023). Sumy. 2023. p. 326. *(the author analyzed seven core full-cycle business links of real estate enterprises from land reserve to after-sales service and offered operational references for relevant firms.)*

11. Yang Yang, Xiao Wanxin**.** Analysis of common problems in the marketing of real estate enterprises. Marketing and competitiveness of socio-economic systems in conditions of sustainable development. International scientific-practical conference (April 17-18, 2024). Sumy. 2024. pp. 198-200. *(the author identified general marketing problems of real estate enterprises, in particular, he investigated market segmentation problems and problems in the product policy of enterprises).*

12. Xiao Wanxin, Yang Yang. Challenges and countermeasures of marketing process management in real estate enterprises. Marketing and competitiveness of socio-economic systems in conditions of sustainable development. International scientific-practical conference (Sumy, Ukraine, April 17-18, 2024). Sumy. 2024. pp. 201-203. *(the author presents the challenges of managing marketing processes in real estate enterprises).*

13. Xiao Wanxin, Lyshenko M. A. The characteristics and importance of marketing process management. Marketing support of the product market. Collection of abstracts of the XVI International Scientific and Practical Conference (Poltava, May 14, 2024). Poltava: PDAU. 2024. pp. 99-101. *(the author defined marketing process management, analyzed its four core features, and elaborated its value in lifting operational efficiency, customer satisfaction and corporate market competitiveness.)*

LIST OF SYMBOLS

BPM - Business Process Management

CRM - Customer Relationship Management

BPR - Business Process Reengineering

BPI - Business Process Improvement

ERP - Enterprise Resource Planning

RPA - Robotic Process Automation

GDP - Gross Domestic Product

MLS - Multiple Listing Service

AI - Artificial Intelligence

VR - Virtual Reality

AR - Augmented Reality

IT - Information Technology

BPMN - Business Process Model and Notation

ARIS - Architecture of Integrated Information Systems

KPI - Key Performance Indicator

CPL - Cost Per Lead

CAC - Customer Acquisition Cost

CSAT - Customer Satisfaction

NPS - Net Promoter Score

ROI - Return on Investment

ROMI - Return on Marketing Investment

CPM - Cost Per Mille

REITs - Real Estate Investment Trusts

LEED - Leadership in Energy and Environmental Design

BIM - Building Information Modeling

ESG - Environmental, Social and Governance

UAH - Ukrainian Hryvnia

CLV - Customer Lifetime Value

KCP	-	Key Control Point
CDP	-	Customer Data Platform
NRV	-	Net Referral Value
Martech	-	Marketing Technology
BI	-	Business Intelligence
PDCA	-	Plan-Do-Check-Act
SOP	-	Standard Operating Procedure
API	-	Application Programming Interface
MAP	-	Marketing Automation Platform
RFM	-	Recency-Frequency-Monetary
DID	-	Difference-in-Differences

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INTRODUCTION

Relevance of the topic. Currently, the global situation still faces many unstable and uncertain factors, with the situation becoming increasingly complex and severe. Externally, issues such as global inflation, supply chain shortages, and international tensions are difficult to resolve completely in the short term, and economic recovery and growth continue to face multiple uncertainties. Domestically in China, after more than forty years of reform and opening up, the national economy has developed rapidly, residents' living standards have steadily improved, and the real estate industry has developed particularly swiftly, remaining a crucial pillar industry supporting China's economic development for decades. However, in recent years, the Chinese economy has faced the triple pressures of demand contraction, supply shocks, and weakening expectations, with domestic economic growth pressure continuously increasing and economic growth slowing down in some regions. After nearly three decades of rapid development in China's real estate industry, market demand is approaching saturation, and the long-adopted model of high debt and high expansion is unsustainable. The construction industry has shifted from "high-speed development" to "high-quality development." Furthermore, the implementation of various regulatory policies, the enforcement of housing price and loan restrictions in various regions, and the continuous changes in the marketing environment pose enormous challenges to the development of real estate enterprises. The dual pressures from the internal and external environments have centrally exposed the drawbacks of traditional functional marketing management: serious departmental silos, fragmented processes, inefficient end-to-end response, and a disconnect between strategy and execution, making it unable to adapt to the dynamic and complex market environment. BPM, as a core methodology for breaking down functional barriers and improving operational efficiency, has become a key pathway for the digital transformation of real estate enterprises. However, the industry currently generally faces the core pain point of disconnection among the four elements of strategy, process, organization, and

technology, lacking a systematic theoretical framework that integrates these four elements and a practically implementable institutional solution validated by rigorous empirical evidence. Therefore, against the backdrop of a dynamically changing industry environment, the marketing business process management of real estate enterprises needs to comprehensively consider multiple environmental factors, combine their own resource advantages, and apply BPM theory to carry out optimization research.

Connection of work with scientific programs, plans, and topics. The dissertation was carried out in accordance with the directions of research works of the Department of Management of the Sumy National Agrarian University: «Development of management in the context of international integration processes» 2019- 2023 (state registration number 0119U001336), and the Department of Marketing and Logistics of Sumy National Agrarian University «Marketing of agri-food products in the context of sustainable development» 2021- 2025 (state registration number 0121U113070), in which the author investigated the theoretical and methodological foundations and substantiated the organizational and economic aspects of managing marketing business processes at real estate enterprises.

The purpose and tasks of the research. The purpose of the study is to demonstrate and improve the theoretical foundations, methodological support, and practical recommendations for the organizational and economic aspects of marketing business process management in real estate enterprises.

In accordance with the goal, the following tasks were set and solved:

1. Systematize the theoretical connotation of marketing business process management in real estate enterprises and explore the evolution of its economic essence.
2. Based on the construction of an innovative business process management model, demonstrate the core operating principles of the real estate enterprise marketing BPM system and organizational structure.

3. Propose an evaluation method for the key influencing factors and core functions of marketing BPM in real estate enterprises, providing a basis for strategy formulation and management process optimization.

4. Analyze the modern trends in the dynamic development process of marketing business processes in real estate enterprises.

5. Deconstruct the organizational structure and process combination components of marketing BPM in real estate enterprises.

6. Clarify the pathways and characteristics for enhancing marketing BPM effectiveness, focusing on tapping the potential of real estate enterprise marketing processes.

7. Construct a new evaluation system for the marketing BPM level of real estate enterprises.

8. Propose evaluation dimensions, pathways, and tools for identifying development opportunities in real estate enterprise marketing processes.

9. Build the core ideas for the formulation and implementation of marketing BPM optimization plans for real estate enterprises.

Research object and research content. The object of the study is the entire process of marketing business process management in real estate enterprises. The subject of the study is the theories, methods, and application principles for strengthening the marketing business process management system and tools of real estate enterprises.

Research methods. This study comprehensively utilizes multiple scientific research methods to ensure the scientificity, rigor, and reliability of the research conclusions, as follows:

Abstract-logical method: Conduct a systematic analysis and theoretical generalization of relevant domestic and international research results, sort out the evolution of BPM theory, refine the core elements and operational logic of real estate marketing BPM, construct the theoretical analysis framework of this study, and abstractly sublimate the empirical results to form conclusions of universal applicability.

Literature research method: Through searching, organizing, and in-depth analysis of academic literature, industry white papers, policy documents, and internal corporate materials related to BPM theory, real estate marketing management, digital transformation, and quasi-experimental research methods, both domestically and internationally, identify the achievements, shortcomings, and research gaps of existing studies, laying a solid theoretical foundation for this research while providing a reference basis for research design and method selection.

Comparative analysis method: Systematically collect and compare the core statistical data of the Chinese and Ukrainian real estate markets from 2020 to 2024, conduct an in-depth analysis across multiple dimensions, including market fluctuation characteristics, driving factors, supply and demand logic, product structure evolution, and policy environment, to reveal the fundamental differences between the two markets, providing a basis for research on marketing BPM adaptability in different market environments.

Questionnaire survey method: Design and implement the "On-site Visitor Customer Satisfaction Questionnaire" and the "Contract-signing Customer Satisfaction Questionnaire," using a 5-point Likert scale to quantitatively evaluate customer experience. The survey covers multiple on-sale real estate projects in the Northern Henan region, with a total of over 1,800 questionnaires distributed and 1,592 valid questionnaires collected, providing first-hand data support for diagnosing marketing process pain points and verifying optimization effects.

Quasi-experimental research method: Adopt a nonequivalent control group pretest-posttest design. Two highly matched on-sale projects of H Real Estate Group in the Northern Henan region, in terms of location, product type, customer positioning,

and sales stage, were selected as the experimental group and the control group, respectively, for an 18-week quasi-experimental study. The marketing BPM optimization plan constructed by this research was implemented for the experimental group, while the control group maintained the original marketing management model. By comparing the changes in core indicators of the two groups before and after the experiment, the actual effects of the optimization measures were accurately assessed.

Statistical analysis method: SPSS statistical software was used to process and analyze the questionnaire survey data and quasi-experimental data. Descriptive statistical analysis was used to analyze the basic characteristics of the sample; independent samples t-tests were used to verify the baseline balance between the experimental and control groups; paired samples t-tests were used to analyze within-group pretest-posttest differences; Fisher's exact test was used to analyze between-group differences in categorical variables; and the Difference-in-Differences (DID) model was used to strip away external interfering factors such as market trends and seasonal fluctuations, precisely identifying the net treatment effect of the marketing BPM optimization measures.

In addition, this study also employed the methods of analysis and synthesis to systematically dissect the internal and external factors influencing the effectiveness of real estate marketing BPM; the method of dialectical materialism to reveal the intrinsic connections and interaction mechanisms between the macro-market environment and micro-enterprise processes; and the methods of induction and deduction to summarize the evolution patterns and future development trends of real estate marketing processes, deducing the core directions and implementation pathways for marketing BPM optimization.

The scientific novelty of the obtained results. The core innovative achievements of this research are as follows:

First obtained:

constructed a dynamic optimization model for real estate marketing BPM featuring "one core, two cornerstones, three engines, and one closed loop," integrating

strategic alignment, organizational assurance with process, technology, and data engines organically for the first time, solving the core problem of the disconnection of the four elements in existing research;

employed a nonequivalent control group pretest-posttest quasi-experimental design combined with a Difference-in-Differences model to quantitatively verify the net effects of real estate marketing BPM optimization measures, precisely stripping away the influence of external interfering factors, improving and refining the systematic framework and rigorous empirical verification in this field;

proposed a five-module management institutional system for real estate marketing BPM based on empirically verified results, consolidating optimization measures into standardized institutions for long-term execution, forming a complete research closed loop of "theoretical model→empirical verification→institutional consolidation".

Improved:

the methodological approach to evaluating the effectiveness of marketing business process management at real estate enterprises, which, unlike existing approaches, is based on the integrated assessment of four key dimensions: marketing investment efficiency, sales conversion effectiveness, capital turnover efficiency, and customer value creation, while also incorporating qualitative factors of the external and internal environment, including regulatory and policy, market, and organizational factors. This approach ensures a comprehensive integration of quantitative measurement and qualitative analysis, enhances the reliability of evaluating the effectiveness of marketing business processes, and supports informed managerial decision-making aimed at improving marketing business process management under the dynamic conditions of the real estate market.

the methodological approach to implementing the optimization of marketing business processes at real estate enterprises, which, unlike existing approaches, proposes a phased digital transformation pathway based on the model of "infrastructure development – deepened digital application – intelligent upgrading – continuous optimization", defining the key objectives, priorities, and implementation tools at each

stage. This approach ensures the systematic digital transformation of marketing business processes, enhances the effectiveness of their management, facilitates the adaptation of real estate enterprises to changing market conditions, and creates the foundation for sustainable development and improved competitiveness.

the methodological approach to customer lifecycle management at real estate enterprises, which, unlike existing approaches, is based on the application of a dynamic iterative lead scoring model and an automated lead nurturing mechanism throughout all stages of customer interaction. The proposed approach enables personalized marketing communications, improves the accuracy of customer segmentation and prioritization, maximizes customer lifetime value, increases sales conversion rates, and fosters long-term customer relationships within real estate enterprises.

Further development:

the theoretical substantiation of the economic essence and evolution of marketing business process management in real estate enterprises by expanding the conceptual framework regarding the interrelationship between strategic alignment, business process reengineering, organizational change, and digital technological enablement of marketing activities. Unlike existing approaches, the proposed theoretical generalization considers marketing business process management as an integrated system for creating customer value and achieving competitive advantage, thereby enhancing the operational efficiency of real estate enterprises under conditions of digital transformation and dynamic market change.

the theoretical and methodological foundations of the operating principles of the marketing business process management system in real estate enterprises by clarifying its core management functions, improving the organizational framework for cross-functional collaboration, and adapting the organizational structure of marketing business process management. Unlike existing approaches, a comprehensive framework for the allocation of functions, authority, and responsibilities among organizational units is proposed, ensuring the coordination of marketing business processes, enhancing interdepartmental collaboration, improving managerial

responsiveness, and increasing the overall effectiveness of real estate enterprises in the context of digital transformation.

the theoretical and methodological framework for analyzing the dynamic development trends of marketing business process management in real estate enterprises through the development of a comprehensive analytical assessment system covering the level of marketing digitalization, the degree of business process automation, customer satisfaction, and marketing expenditure efficiency. Unlike existing approaches, the proposed framework enables the identification of key trends in the development of marketing business processes, including intelligent marketing, customer experience-oriented marketing, and green marketing, thereby improving the quality of strategic managerial decision-making and enhancing the adaptability of real estate enterprises to the evolving market environment.

The scientific and practical significance of the dissertation. The theoretical significance of this study is: It systematically constructs a theoretical system of real estate marketing BPM that integrates the four major elements of strategy, process, organization, and technology, enriching the application research of BPM theory in a specific industry. It introduces quasi-experimental design and the Difference-in-Differences model for empirical research, providing a methodological reference for empirical studies in the field of real estate marketing management. It reveals the operational laws and optimization pathways of real estate marketing processes, thereby refining the theoretical foundations of real estate marketing management.

The practical significance of this study is: By combining theoretical analysis and empirical testing, it deeply analyzes the problems and causes existing in the current marketing BPM of real estate enterprises, formulates process optimization plans adapted to the actual situation of enterprises, enhances marketing operational efficiency and customer satisfaction, helps enterprises gain an advantage in fierce market competition, and clarifies the direction and goals of enterprise digital transformation, which is of great significance for achieving high-quality development. It promotes the improvement and development of marketing process management in

real estate enterprises: Optimizes the marketing business processes of real estate enterprises, strengthens enterprises' awareness of the importance of BPM, provides a reference for similar enterprises to carry out marketing process optimization, and promotes the overall sustainable development of the industry. It deeply explores the issues of marketing BPM in real estate enterprises, analyzes the current situation and shortcomings, introduces new technologies, strategies, and concepts to optimize marketing processes, assists enterprises in formulating implementable BPM implementation plans, provides references for real estate enterprises of different sizes and regions, and guides enterprises to formulate efficient strategies by combining the external environment with their own actual conditions.

In summary, this study not only constructs a scientific theoretical system and evaluation method for the marketing business process management of real estate enterprises but also provides practical guidance for process optimization, playing an important role in promoting industry innovative development and digital transformation.

Applicant's personal contribution. The applicant independently searched and reviewed domestic and international literature related to BPM theory and real estate marketing management, constructed the theoretical analysis framework for this study, selected the research methods and technical route, designed the questionnaire survey and quasi-experimental research plan, completed data collection, statistical processing, and result analysis. Under the guidance of the supervisor, interpreted and summarized the research results, wrote the full text, and proposed implementable practical recommendations.

Approbation of the results of the dissertation. The main results of the dissertation were published at 6 national and international scientific conferences:

International Conference on Science and Practice: Digital Transformation and Technology for Sustainable Development, Branch of Modern Education, Science and Practice (Kharkiv, Ukraine, 2023); Conference on “Real problems and prospects for the development of Accounting, analysis and control in socially oriented business

management Systems" (March 2023, Ukraine); Science and Practice conference for teachers, graduate students and students (April 2023, Sumy, Ukraine); International Scientific and Practical Conference "Strategic management of the agri-food sector in the conditions of economic globalization: security, innovations, leadership" (September 28, 2023, Poltava, Ukraine); Marketing and Competitiveness of socio-economic systems in the Context of Sustainable Development: International Conference on Science and Practice (April 2024, Sumy, Ukraine); XVI International Scientific and Practical Conference: Marketing Support of the Food Market (May 14, 2024, Poltava, Ukraine).

Publication of obtained results. The core results of the research were published in 13 academic papers: 6 in professional journals of Ukraine, 1 in a journal indexed in Scopus and Web of Science databases, and the remaining 6 in other journals and conference proceedings (6).

Structure and scope. The dissertation consists of an introduction, three sections, conclusions, references, and appendices. The total volume of the paper is 251 pages. The work contains 51 tables, 26 figures, 3 appendices, and a reference list of 157 items spanning 27 pages.

SECTION 1
THEORETICAL AND METHODOLOGICAL BASIS OF MARKETING BUSINESS PROCESS MANAGEMENT IN REAL ESTATE ENTERPRISES

1.1 The Economic Substance of Marketing Business Process Concept and Management

Against the backdrop of intensifying global market competition, shifting customer demands toward personalization, and digital technologies reshaping corporate operational models, traditional functional organizations have become increasingly vulnerable to systemic flaws: departmental silos, fragmented workflows, inefficient end-to-end responsiveness, and disconnect between operational activities and customer value creation. These challenges highlight the growing inadequacy of function-oriented management approaches in dynamic market environments. In this context, process-centric BPM has emerged as the paradigm shift in modern enterprise management. Serving as a core methodology for digital transformation, operational efficiency enhancement, balanced division of labor and collaboration, and the development of customer value while building sustainable competitive advantages, BPM represents the essential framework for modern business operations.

Business processes serve as the core framework and fundamental units within the BPM theoretical system. According to the ISO9000 Quality Management System standards, business processes consist of interconnected activities that convert inputs into outputs, with six key components: inputs, activities, activity interactions, outputs, customers, and value. Hammer & Champy (1993) defined business processes from a customer value perspective as a set of interrelated activities collectively creating value for customers, where the process begins with customer demand inputs and concludes with value realization, with customers being the ultimate evaluators of process value. Porter (1985) characterized business processes from a competitive advantage perspective as discrete value activities encompassing corporate design, production,

marketing, product delivery, and supporting activities, emphasizing their role as basic units of value creation where competitive advantage stems from optimizing, coordinating, and managing value processes. Integrating these definitions reveals that business processes essentially form end-to-end activity loops centered on value creation, operating through a core logic of input-transformation-output-feedback-optimization cycles. They serve as the primary vehicle for enterprises to transform resources into market value and achieve operational objectives.

Marketing business processes represent the concrete implementation of business processes within corporate marketing functions. They constitute an end-to-end cross-functional activity suite encompassing market insights, customer acquisition, value delivery, customer relationship management, and value co-creation in marketing operations, serving as the core application scenario of BPM theory in marketing. Payne & Frow (2005) emphasized in their Customer Relationship Management (CRM) strategic framework research that marketing business processes serve as the fundamental vehicle for enterprises to realize customer value. The core lies in establishing a cross-functional process system centered around the customer lifecycle, specifically covering five key components: strategic development, value creation, multi-channel integration, information management, and performance evaluation. It clarifies that the primary management focus should be on end-to-end cross-functional processes rather than isolated sub-processes within individual departments. Unlike traditional functional marketing management, marketing business process management breaks down barriers between marketing, sales, service, and branding departments. Starting from customer needs and ending with value realization and long-term relationship maintenance, it achieves closed-loop management of marketing activities, representing the essential pathway for enterprises to implement customer-centric operational transformation.

Since the emergence of process management concepts in the 1990s, scholars worldwide have conducted extensive research on the connotation, boundaries, and core logic of BPM, forming differentiated cognitive frameworks based on diverse

perspectives. This study systematically reviews key findings by tracing theoretical evolution and regional research characteristics.

European scholars served as the foundational architects and core innovators of the BPM theoretical framework, driving its conceptual evolution from process reengineering to full lifecycle management through three dimensions: theoretical origins, strategic attributes, and application boundaries. First, from the perspective of process reengineering origins, BPM theory traces back to Business Process Reengineering (BPR), with Michael Hammer and James Champy as its principal pioneers. In 1990, Hammer first introduced the concept of "business process reengineering" in Harvard Business Review, followed by their systematic definition in 1993's *Business Reengineering*. They defined BPR as "fundamental rethinking and radical redesign of business processes to achieve significant improvements in key performance indicators such as cost, quality, service, and speed," emphasizing three core characteristics: fundamental nature, thoroughness, and measurable impact, while insisting on customer needs as the sole focal point. Later, Hammer (2005) refined the core concept, asserting that BPM's essence lies in "processes" themselves, with enterprise management focusing on value creation and continuous optimization through processes rather than mere disruptive restructuring. Their study also revealed that 50%-70% of corporate BPR projects failed to meet expectations, primarily due to neglecting full lifecycle process management, organizational culture alignment, and continuous optimization mechanisms. These findings propelled BPM's evolution from isolated reengineering initiatives to a systematic management system. Secondly, from the perspective of value chain strategy, Michael E. Porter laid the core theoretical foundation for BPM's strategic attributes. In 1985, Porter introduced the "value chain" model in *Competitive Advantage*, elevating BPM from an operational tool to a core management paradigm supporting corporate strategy. He categorized business processes into two major types: core activities and supporting activities, emphasizing that all business processes ultimately aim to create sustainable competitive advantages. BPM is defined as "a management process involving the decomposition, coordination,

and optimization of value activities across an enterprise's value chain to achieve cost leadership or differentiation strategies." The core of BPM lies in identifying synergies among value chain activities and vertical process linkages within industrial chains, establishing BPM's strategic significance and the fundamental principle that process systems must align with corporate strategy. Thirdly, from a customer value-oriented perspective, Adrian Payne and Pennie Frow expanded the application boundaries of BPM through the lens of customer relationship management and strategic synergy. In 2005, they defined BPM as "a strategic management approach centered on customer value, involving systematic design, integration, and continuous optimization of cross-functional core processes." This definition clarified that its primary focus lies in end-to-end cross-functional processes, reinforcing the principle that process systems must align with corporate strategies. Drawing on research from Gartner (2001) and Kale (2004), they established customer experience and value enhancement as the core evaluation criteria for process design, thereby extending BPM's scope from internal operations to encompass end-to-end interactive processes between enterprises and customers/stakeholders.

Ukrainian scholars have focused their BPM research on quantitative modeling and practical applications, achieving localized expansion through a data-driven dynamic process management perspective. Key representatives include Oleksandr Melnychenko and Tetiana Osadcha. Based on dynamic research of Poland's real estate market, Melnychenko et al. (2022) defined BPM as "a management methodology system constructed through quantitative analysis and mathematical models to dynamically model business processes, predict trends, achieve continuous optimization, and monitor full lifecycle operations." The study emphasizes BPM's core focus on process quantifiability, predictability, and optimizability, proposing that its essence lies in achieving dynamic control and sustained performance improvement through data-driven process modeling. Furthermore, this research expands BPM's management scope from internal corporate operations to dynamic interactions between external macro-environments and business processes, highlighting its core value in enhancing

organizational adaptability to external environmental changes and refining the conceptual framework of BPM lifecycle management.

Chinese scholars 'research on BPM is primarily based on the institutional environment of emerging markets and local enterprise management practices, focusing on three key directions: localization adaptation, strategic transmission functions, and dynamic flexible management. Zhang (2013), based on studies of the linkage between China's real estate market and macroeconomics, defined BPM from the perspective of emerging market practices as "a management practice system that adapts to local market institutional environments, industry development characteristics, and macroeconomic cycles, and involves localized restructuring, dynamic optimization, and implementation of core business processes." He emphasized that Western classical theories cannot be directly applied to the Chinese market, highlighting the core feature of BPM's localization adaptability. Li et al. (2022), from the perspective of corporate risk resilience, proposed that the core of BPM is "flexible management of business processes," which involves restructuring and optimizing core processes to achieve dynamic adaptation to macroeconomic policies and market fluctuations, balancing operational efficiency improvement with risk prevention, thereby enriching BPM's dynamic adaptability. Xu and Chen (2012) clarified BPM's strategic transmission function, defining it as "a core management vehicle connecting the implementation of corporate top-level strategies with external environmental responses." They suggested that enterprises can effectively transmit external environmental changes to operational decisions through systematic design and continuous optimization of core processes, while decomposing top-level strategies into executable process activities, thereby reinforcing BPM's strategic attributes.

As corporate practices deepen, the global academic and industrial communities have reached a consensus: BPM is not a one-time process reengineering project, but a dynamic management system spanning the entire lifecycle of processes. Based on global research findings and corporate experience, the BPM full lifecycle management framework has matured. This framework integrates the groundbreaking reengineering

philosophy of BPR with the incremental optimization approach of Business Process Improvement (BPI), defining BPM as a process-centric dynamic system management methodology that covers the entire lifecycle closed loop encompassing process exploration, design, execution, monitoring, and optimization. This definition emphasizes BPM's continuity and dynamism, distinguishing it from BPR's one-time radical transformation and BPI's localized process fine-tuning. Meanwhile, advancements in digital technologies have further enriched the full lifecycle perspective of BPM. Tools such as process mining, workflow management systems, Robotic Process Automation (RPA), and big data analytics have become core pillars of BPM full lifecycle management, driving its evolution from operational efficiency tools to a strategic management paradigm supporting enterprise strategy implementation.

Through comparative analysis of BPM definitions proposed by domestic and international scholars, while eliminating divergent contextual expressions and research perspective biases, six core components of BPM can be identified. These elements constitute the essential core of the BPM concept and serve as the fundamental boundaries distinguishing BPM from traditional functional management and localized process optimization.

Dual Core Orientation: Alignment of Customer Value Creation with Corporate Strategy. The design, refactoring, and optimization of all processes shall ultimately be evaluated based on the enhancement of customer value and improvement of customer experience, while the process system must fully align with the company's development strategy and competitive objectives.

Core management object: End-to-end cross-functional business processes. The core management object refers to end-to-end full-chain processes that create value for customers across functional departments, with the key characteristics of breaking down functional division barriers and achieving cross-functional process collaboration.

Methodological Core: Fundamental process reengineering and continuous iteration throughout the entire lifecycle. This encompasses both a thorough

reevaluation and complete redesign of existing processes to achieve a leapfrog improvement in performance, as well as emphasizing continuous management across all process stages with dynamic optimization in response to internal and external environmental changes. Implementation Foundation: Data-driven quantitative management and digital technology empowerment. Data-based quantitative analysis and process modeling constitute the core foundation for effective BPM implementation, while digital technologies serve as the critical support for implementation. This requires comprehensive lifecycle quantitative monitoring of key process indicators, integrating digital tools to achieve standardization, automation, visualization, and intelligence in process management.

Management boundaries: Comprehensive process coordination and dynamic adaptation across internal and external full-value chains. Management boundaries extend beyond internal operational processes to encompass end-to-end interactive workflows between enterprises and customers, upstream/downstream industrial chain partners, and macro-environmental factors. Through flexible process design, enterprises enhance their risk resilience and environmental adaptability. The ultimate objective is to achieve significant improvement in operational performance and establish sustainable competitive advantages. Through process reengineering and optimization, substantial and transformative enhancements will be realized in key operational metrics, while supporting the implementation of corporate competitive strategies to unify customer value with corporate value. Based on the aforementioned six core elements and incorporating multidisciplinary research findings from domestic and international scholars, this study provides the following integrated and precise definition of BPM: BPM (Business Process Management) is a systematic strategic management paradigm centered on customer value creation and enterprise strategy implementation. It focuses on end-to-end cross-functional business processes, employing data-driven quantitative modeling, fundamental process reengineering, and continuous lifecycle optimization to break down functional management barriers. By integrating digital technologies, BPM enables seamless collaboration between internal

value chains and external stakeholders across all operational processes. This approach delivers significant improvements in core business metrics such as cost efficiency, quality assurance, service excellence, and operational productivity, ultimately establishing sustainable competitive advantages for enterprises. This definition comprehensively covers the six core elements of BPM, integrating seminal research findings from global scholars. It preserves the fundamental essence of process reengineering in BPR theory while expanding its full lifecycle scope to include continuous management, strategic alignment, data-driven approaches, internal/external collaboration, and localization adaptation. The framework achieves both theoretical rigor and practical applicability. To further clarify the theoretical boundaries of BPM, this study conducts a concise comparison of the core characteristics between BPM and related management concepts, as detailed in Table 1.1.

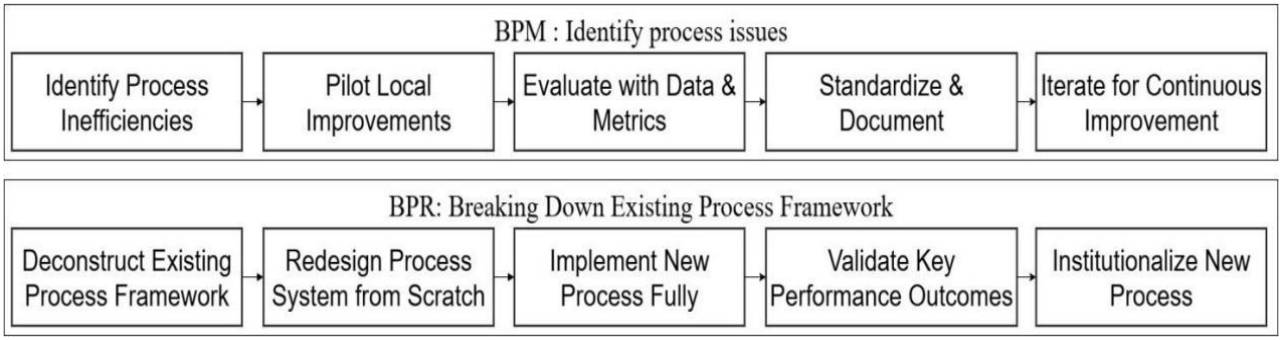

Figure 1.1- Comparison of implementation path flowcharts between 1-BPM and BPR

Source: Compiled and constructed by the author

From an implementation perspective, BPM begins with identifying process inefficiencies, then achieves continuous iterative optimization through localized pilot projects, data evaluation, and standardized implementation - a progressive, closed-loop improvement system. In contrast, BPR fundamentally involves completely deconstructing existing process frameworks, redesigning workflows from scratch, and institutionalizing the new processes after comprehensive implementation and performance validation. This radical, reconstruction-oriented approach represents a one-time transformation project, which explains the core differences in risks and applicable scenarios between the two methodologies.

Table 1.1- Comparison of Core Characteristics Between BPM and Related Management Concepts

Dimensional contrast	BPM	BPR	BPI	Traditional Process Management
Core positioning	Strategic Paradigm for Dynamic Management of the Entire Life Cycle	Fundamental Process Reflection and Thorough Redesign	Local Improvement of Single Process/Stage	Standardization and Implementation of Process Flows
Transformation intensity	Combining incremental optimization with breakthrough redesign through periodic iteration	Radical, one-time reconstruction	Local fine-tuning type mild improvement	Stable maintenance type, without active transformation
Management domain	End-to-end cross-functional management of the core process	Core Business Process Architecture Redesign at the Level	Single process specific stage	Isolated functional internal processes without system integration
Technical support	Integrating digital tools such as Enterprise Resource Planning (ERP), RPA, and big data	Information technology as the core driving force	Experience-based judgment as the core	Simple standardization tool, no digital empowerment
Applicable scene	Process stability requires continuous alignment with strategic and market changes	The process has fundamental defects requiring comprehensive reconstruction	Low efficiency of single process requires no architectural adjustment	Industrial Standardized Production Scenario
Intrinsic association	Inheriting the core philosophy of BPR and integrating BPI methods	Breakthrough Transformation Phase in the BPM System	Local optimization tools in BPM systems	The theoretical pioneer of BPM, laying the foundation for process standardization

Source: Compiled and constructed by the author

The theoretical origins of BPM can be traced back to Adam Smith's labor division theory proposed in the 18th century. Through over two centuries of management practice evolution, the core values and inherent contradictions of the division of labor theory jointly propelled the emergence and development of BPM. The

essence of BPM lies in its transcendence of labor division theory - while retaining the efficiency advantages of specialized division of labor, it addresses functional barriers and process fragmentation caused by excessive specialization through end-to-end process management.

In 1776, Adam Smith systematically proposed the theory of labor division of labor for the first time in his work *The Wealth of Nations*, using an example of a needle factory. This laid the foundation for modern management science. Smith argued that labor division significantly enhances production efficiency through three core mechanisms: skill specialization, reduced process switching costs, and promotion of technological and tool innovation. He also emphasized that the depth of labor division is determined by market scope. The labor division theory gave rise to hierarchical organizational structures centered on functional division and mass production models based on assembly lines, establishing the core management principle of "efficiency supremacy." This theory shares profound theoretical connections with modern BPM: both aim to "improve organizational efficiency." BPM's logic of "process mapping - node optimization - cross-functional collaboration" inherits and develops Smith's framework of "division of labor decomposition – specialization - coordination," while its concept of "customer value synergy" represents a modern commercial extension of Smith's "social collaboration" philosophy.

In the early 20th century, Taylor and Ford elevated the theory of labor division to the pinnacle of industrial practice, laying the methodological foundation for BPM's process node optimization and standardization. Through his practice at Midville Steel Works, Taylor established scientific management theory by extending labor division from macro-level functional roles to micro-level operational procedures. By implementing modules such as task decomposition, time-motion analysis, and operational standardization, he achieved exponential improvements in production efficiency, providing core methodological support for BPM's "process node standardization" and "operation efficiency optimization." Henry Ford's automobile assembly line production model demonstrated large-scale industrial application of

labor division theory. By breaking down production processes into dozens of standardized procedures and utilizing dynamic conveyor belts for seamless interoperation, he created a "dynamic collaborative division of labor" model. This approach not only achieved extreme standardization and specialization of processes but also facilitated coordination between operations through assembly line design, aligning perfectly with BPM's "end-to-end process collaboration" philosophy. This proved that efficiency gains from division of labor must be accompanied by process-level coordination mechanisms, becoming the fundamental conceptual origin for BPM's resolution of inherent divisional contradictions. Key insights from related practices regarding BPM are detailed in Table 1.2.

Table 1.2- Core Insights from Early Management Practices on BPM

Management Practice Cases	Core Management Methodology	Theoretical Implications for BPM
Taylor Scientific Management	Work breakdown → Time-motion analysis→Standardized operation	Standardization and refinement of process nodes constitute the core pathway to enhance operational efficiency.
Ford assembly line production	Process decomposition→Dynamic transmission coordination→Full-process standardization	End-to-end process collaboration requires balancing specialized division of labor with overall collaborative efficiency
Sloan Divisional System	Combination of Functional Division of Labor and Decentralization of Operations	Functional division of labor must be aligned with strategic objectives and operational processes to prevent functional silos from compromising overall efficiency.

Source: Compiled and constructed by the author

As market environments transition from scarcity economies to surplus economies and customer demands shift from standardization to personalization, the inherent limitations of labor division theory have become increasingly apparent. The core contradiction lies in the conflict between "extreme specialization" and "end-to-end process coordination," which has triggered a series of management dilemmas that became the driving force behind BPM theory's emergence. Research by Hammer & Champy (1993) indicates that the "fragmented processes" formed by traditional functional organizations based on division theory constitute the fundamental root of corporate management challenges, ultimately leading to three core operational

dilemmas: First, operational efficiency challenges where complete business processes are fragmented across departments, resulting in excessive waiting times, repetitive tasks, and rework—leading to prolonged process cycles and high operational costs. Second, customer value challenges where departments focus solely on completing their own functional tasks rather than delivering end-to-end customer value, creating a disconnect between corporate operations and customer needs. Third, organizational innovation challenges where extreme functional specialization narrows employee perspectives, leading to rigid hierarchical structures that struggle to adapt to dynamic market environments and severely suppress innovation capabilities. At their core, these dilemmas represent fundamental conflicts between traditional "function-oriented" management models and modern enterprises' operational demands of "customer value orientation and rapid market response." The birth of BPM theory aims precisely to systematically resolve this critical contradiction.

From the inception of labor division theory to the maturation of modern BPM management paradigms, the evolution of enterprise management theory has consistently centered on the core objective of 'balancing division efficiency with process synergy to maximize customer value,' forming a clear historical trajectory.

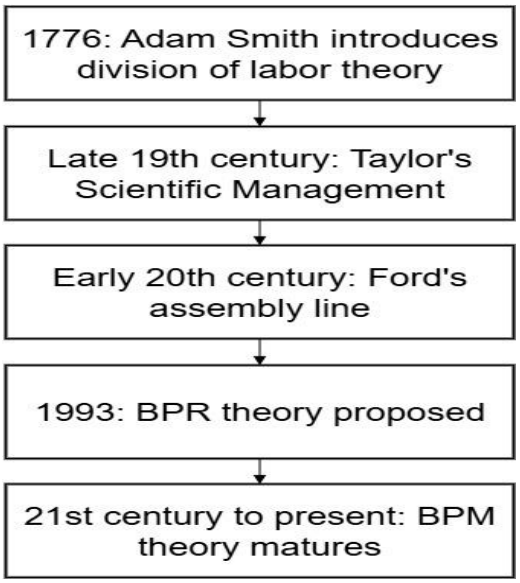

Figure 1.2- Evolution of BPM

Source: Compiled and constructed by the author

Table 1.3- Evolutionary Stages from Division of Labor Theory to BPM Theory

Evolutionary Stage	Time period	Core Theoretical Foundations	Core management objectives	Core limitations
The Era of Functional Division of Labor	Late 18th century to 1980s	Theory of Labor Division of Labor, Theory of Scientific Management	Enhance production efficiency and achieve scaled-up production	Severe departmental barriers, fragmented processes, disconnection of customer value, and organizational rigidity
The Era of Process Reengineering	Late 1980s to 1990s	BPR Theory of Business Process Reengineering	Achieve systematic improvements in cost, quality, service, and speed	High risk of transformation, lack of continuous optimization mechanisms, and neglect of organizational culture alignment
The Era of Process Management	Early 21st century to present	Integrated BPM theory, value chain theory, and CRM theory	Achieve synergistic enhancement of customer and enterprise value to build sustainable competitive advantage	Dynamic adaptation to digital technologies and evolving market environments is required

Source: Compiled and constructed by the author

The era of functional specialization (late 18th century to 1980s) was fundamentally guided by Adam Smith's labor division theory. From Taylor's scientific management and Ford's assembly line production to Sloan's division of operations and the widespread adoption of hierarchical organizational structures, the functional specialization model became the dominant paradigm in industrial-era corporate management. During this period, business management focused on internal specialization and efficiency gains within functional units, treating processes as ancillary elements rather than implementing end-to-end workflow design and management. After the 1980s, fundamental shifts in the global market environment exposed the inherent limitations of this model, catalyzing a transformative shift in management paradigms.

The era of business process reengineering (late 1980s to 1990s) was marked by Hammer's groundbreaking proposal of BPR in 1990, which ushered in a fundamental shift from "function-oriented" to "process-oriented" management paradigms. In 1993,

Hammer and Champy systematically established the theoretical framework of BPR, sparking a global wave of process reengineering that positioned processes at the core of corporate management for the first time. However, the radical transformation approach of BPR also exposed significant limitations, with 50%-70% of corporate BPR projects failing to meet expected outcomes. Key challenges included neglecting organizational culture adaptation, inadequate personnel motivation reforms, and the absence of sustained process monitoring and optimization mechanisms. These issues ultimately drove process management theory to evolve from isolated reengineering practices toward a systematic, lifecycle-oriented BPM framework.

Since the early 21st century, the era of process management has seen academia and industry integrate groundbreaking concepts like BPR for transformative restructuring, Business process integration for incremental optimization, and Peter W. Porter's value chain theory through advancements in internet technologies and digital tools, ultimately establishing a mature BPM framework. During this phase, BPM evolved from standalone process improvement initiatives into a strategic management paradigm encompassing all business operations and workflows, creating a closed-loop lifecycle management system covering exploration, design, execution, monitoring, and optimization. The deep integration of digital technologies became defining characteristics, with process mining, RPA, and big data analytics serving as core pillars for lifecycle management. Recent years have witnessed BPM's evolution toward intelligent, ecosystem-driven, and agile approaches, expanding from internal process management to cross-enterprise collaboration across industrial supply chains, thereby establishing itself as the foundational management platform for corporate digital transformation.

1.2 Classification of Marketing Business Process in Real Estate Enterprises

The real estate industry serves as a pillar of the national economy. Property developers 'value chains span three critical phases: investment, development, and

services, with marketing acting as the central link that connects the entire process. The effectiveness of marketing strategies directly determines developers' cash flow security and project investment returns, thereby influencing the industry's macroeconomic support capacity. As primary project developers, real estate companies function as pivotal nodes integrating upstream and downstream industrial chains including construction, building materials, and finance. Their operational efficiency significantly impacts the stability of related industries (Zhang Jianguo, 2014). Moreover, their digital transformation and business model optimization exert profound effects on national economic development.

The real estate market comprises two interconnected segments: the primary market and the secondary market. The primary market includes land transfer markets and new residential property markets. The land transfer market features government-monopolized supply and market-driven bidding by developers, serving as the foundational stage for property marketing. The new residential property market centers on presale systems, with marketing processes covering project positioning, customer acquisition, sales conversion, and delivery services—forming the core mechanism for developers' capital recovery. The secondary market encompasses existing home transactions and rental markets. The existing home market relies on brokerage services as its core intermediary function, focusing on supply-demand matching and transaction risk management. The rental market prioritizes long-term property management, emphasizing tenant matching, product optimization, and tenant retention strategies. Real estate products exhibit characteristics such as fixed nature, unit-specific attributes, and regional distribution, resulting in pronounced market segmentation. Under policy guidance, the industry has entered a phase of existing inventory competition, with the Matthew effect continuously intensifying (Zhang Yao, 2023).

The dynamic interplay between primary and secondary markets manifests in three key aspects: First, price transmission effects - the average transaction price of second-hand homes serves as the core pricing benchmark for new properties, with land and new home prices exerting inverse influence on second-hand housing price

expectations. Second, supply-demand synergy - secondary market performance directly impacts developers' land acquisition intentions, development scale, and marketing strategies. Third, customer flow coordination - improvement-oriented replacement demand from second-hand homes constitutes the primary source of new home buyers, prompting mainstream developers to implement integrated marketing strategies across both primary and secondary markets.

Macroeconomic variables are the underlying determinants of real estate market demand, directly guiding the formulation of marketing strategies by property developers. The growth rate of Gross Domestic Product (GDP) determines residents 'purchasing power and market confidence, while interest rate levels directly impact home purchase costs. Urbanization rate serves as the core support for long-term market demand, and disposable income determines homeowners' purchasing capacity. Cyclical changes in these variables correspond to differentiated adjustments in marketing orientation. Currently, China's property developers are transitioning from a "product-centric" approach to a "customer-centric" one, with customer needs serving as the core starting point for the entire marketing management process. The 1-3 year development cycle of real estate projects leads to significant supply-side lag, making product supply-demand mismatches highly likely. Among micro-market variables, regional inventory digestion cycles, competitor dynamics, and shifts in customer preferences directly determine the implementation boundaries and adjustment directions of project marketing strategies, serving as the direct basis for marketing decisions. Real estate market supply and demand are influenced by multiple factors such as land availability, finance, income levels, and policies. The current market's core demand has shifted toward rigid residential needs and improved housing, prompting property developers to gradually transition their product offerings toward higher quality and refined services.

The real estate market comprises four key participants: developers, agents, brokers, and management companies. These entities play distinct roles and responsibilities in the marketing process, collectively forming a comprehensive

marketing ecosystem (see Table 1.4 for core information). Real estate developers serve as the primary responsibility bearers in marketing efforts, requiring the implementation of CRM systems to achieve end-to-end customer lifecycle management. From a service marketing perspective, consumers' perception of service quality directly influences their behavioral intentions and marketing effectiveness (Zeithaml, 1996). Commercial banks, appraisal agencies, and stakeholders across the industry chain contribute to the marketing framework through financial support, pricing references, and cost constraints respectively (Yang Bin, 2004; Wang Wei, 2025).

Table 1.4 - Marketing Positioning and Core Responsibilities of Real Estate Market Entities

Main market players	Core positioning	Core Responsibilities
Developer	Marketing strategy formulator and comprehensive coordinator of the entire process	Develop marketing strategies and objectives; lead market research, project positioning, and pricing strategies; coordinate cross-departmental resource collaboration and implement end-to-end process control
Agent	New Home Marketing Execution and Professional Service Provider	Provide preliminary consulting services; develop marketing execution plans; oversee on-site sales and channel expansion; assist in payment collection and customer relationship management
Broker's agency	Primary and Secondary Market Linkage Intermediaries and Channel Traffic Mainstream	Distribution and customer acquisition for new homes; intermediary services for existing home transactions; management of rental properties and post-rental services
Management company	Marketing Service Extension and Brand Reputation Maintenance Subject	Service system demonstration during the marketing phase; property delivery and rectification follow-up during the handover phase; community management and new resident recruitment promotion during the operational phase; operation of ownership-type property assets

Source: Compiled and constructed by the author

The real estate industry is characterized by six core attributes: immobility, durability, capital intensity, heterogeneity, policy sensitivity, and regional specificity. These fundamental characteristics fundamentally distinguish real estate marketing

from other product categories, shaping the unique nature of marketing processes.

The immobility and pronounced regional differentiation characteristics determine the regional nature of marketing coverage, necessitating a three-tier value transmission system comprising "regional value-plot value-project value" in process design. Scenario-based experiential elements must be integrated to overcome product perception barriers, while a nationwide standardized model proves impractical, requiring region-specific market-centric process design. The durability and extended decision-making cycles demand marketing processes that span the entire customer decision chain - from single transactions to lifecycle services - while incorporating compliance reviews and commitment tracking mechanisms to ensure long-term fulfillment of marketing promises (Chen Chen, 2013). Capital-intensive operations and strong financial attributes require core marketing processes to prioritize rapid cash flow recovery and liquidity security, closely aligning with capital planning and financing arrangements, while embedding financial services to enhance conversion rates. Product heterogeneity and non-standardization demand differentiated value extraction systems, refined "one-household-one-price" pricing models, and precision-targeted communication strategies. Policy sensitivity and cyclical volatility mandate policy compliance modules with dynamic adaptation features, including policy tracking nodes, compliance review checkpoints, contingency plans, and routine policy analysis mechanisms. Regional characteristics and localized operations necessitate a three-tier framework of "headquarters coordination-regional adaptation-project implementation," coupled with deep market research and localized channel communication strategies.

Figure 1.3- Adaptive Principle Matrix

Source: Compiled and constructed by the author

Guided by industry-specific constraints, marketing process design must adhere to four core principles: customer orientation, strategic alignment, compliance foundations, and flexible collaboration, focusing on six key aspects: First, proactive engagement - marketing should intervene early in project investment decisions and preliminary planning phases to ensure project positioning aligns with market demands. Second, localization - conduct thorough market research to deeply adapt to regional market characteristics and customer demographics. Third, systematization - establish comprehensive customer journey management and lifecycle management processes. Fourth, compliance - integrate compliance management throughout all stages and build a full-process risk control framework. Fifth, collaboration - break down departmental silos to create cross-functional business processes. Sixth, data-driven management - leverage digital systems to enable quantifiable tracking of customer assets and marketing actions, supporting refined operational transformation.

The real estate marketing workflow serves as the core mechanism for project value conversion and the critical link between products and end customers. It can be broadly categorized into two components: core marketing processes and supporting/marketing support processes, which together form a comprehensive marketing framework.

The core marketing business process serves as the primary driver for creating and realizing marketing value, categorized into five major types:

First, analytical processes serve as the foundation for all marketing activities, providing decision-making support throughout the entire workflow. Their core objectives include accurately identifying market demands, competitive landscapes, and customer characteristics to minimize decision-making risks. Specifically, these processes comprise four key sub-processes: market research, competitor benchmarking, customer profiling, and demand forecasting. The essence lies in establishing a closed-loop system through standardized procedures that integrates data collection, analysis, output generation, and decision support.

Secondly, product management processes constitute the core component of marketing value creation. By translating customer needs into product value, they establish project competitiveness and serve as the fundamental mechanism for marketing to drive front-end development. This framework comprises four key sub-processes: project positioning, product strategy formulation, pricing strategy development, and unit type optimization. The fundamental objective is to achieve dynamic equilibrium between product supply and market demand, balancing sales velocity with maximum inventory value maximization.

Third, the promotion process serves as the core component for delivering marketing value. Its primary objective is to accurately convey the project's core value to target audiences, thereby achieving brand exposure and customer lead acquisition. This process comprises four key sub-processes: brand communication, integrated marketing communications (IMC), digital advertising campaigns, and event planning. The essence lies in maximizing communication effectiveness through multi-channel integration.

Fourth, the sales process constitutes the core component for realizing marketing value. Its primary objective is to convert customer intent into transactions, ensuring project sales targets and cash flow recovery goals are met—which serves as the fundamental safeguard for real estate developers' cash flow security. This process

comprises five key sub-processes: site management, channel management, pre-sale registration and launch, transaction conversion, and payment collection management. The core strategy involves enhancing conversion efficiency and payment security through standardized workflows.

Fifth, service processes serve as the cornerstone for extending marketing value and building brand equity. Their primary objectives are to enhance customer satisfaction and loyalty, drive word-of-mouth growth, and boost brand value. These processes encompass four key components: after-sales services, customer relationship management, satisfaction monitoring, and reputation management. The core mission is to transform single transactions into lasting customer relationships while unlocking value throughout the entire customer lifecycle.

Supportive and enabling marketing processes serve as critical pillars for the efficient execution of core workflows, providing systematic, data-driven, and efficiency-enhancing safeguards across the entire process. These processes are categorized into three main types:

First, the CRM process serves as the core foundation for refined customer operations, with the primary objective of transforming customer data into valuable assets to support precision marketing. It comprises three key sub-processes: customer data collection and cleansing, tagging system development, and customer lifecycle tracking, all aimed at achieving comprehensive and detailed management throughout the customer lifecycle.

Secondly, the digital marketing management process serves as the core vehicle for marketing digital transformation. Its primary objective is to enhance the precision of customer acquisition, conversion, and management through digital tools. This process specifically encompasses four sub-processes: social media operations, content marketing, and online event management, with the ultimate goal of establishing an omnichannel marketing system that seamlessly integrates online and offline channels.

Third, the customer generation management process serves as the core foundation for marketing customer acquisition. Its primary objective is to achieve end-

to-end closed-loop management of leads from acquisition to conversion, thereby enhancing lead utilization efficiency. This process comprises three key sub-processes: lead acquisition channel integration, lead scoring and incubation, and lead allocation with follow-up monitoring. The core objective lies in implementing refined lead classification and efficient lead flow management.

Marketing effectiveness evaluation and optimization form a closed-loop process that integrates core operations with supporting workflows. The primary objective is to assess marketing implementation outcomes through quantitative metrics, enabling continuous iterative optimization of processes and strategies - a critical driver for spiral improvement in marketing capabilities. Evaluation should comprehensively consider key performance indicators (KPI) such as sales volume and product conversion rates, alongside process metrics including channel conversion efficiency and return on investment. By implementing lifecycle management logic to streamline non-value-added processes and leveraging a data-driven platform, organizations can achieve dynamic, intelligent closed-loop control systems.

Real estate marketing process management must be deeply aligned with core project development processes and the full-cycle development rhythm to establish an integrated "development-marketing" workflow mechanism. Tailored control process systems should be implemented based on different business types and project positioning.

The real estate industry's mainstream development models can be categorized into three types: fast turnover, premium development, and holding operations. These models exhibit fundamental differences in profit logic and core objectives, requiring differentiated marketing strategies. The fast turnover model focuses on enhancing asset return rates through rapid capital turnover. It demands early-stage marketing involvement, prioritizes cash flow efficiency, maintains high standardization levels, strengthens cross-departmental collaboration, and supports large-scale expansion needs. The premium development model aims to create brand premium through differentiated product and service offerings. This approach requires full-cycle

marketing engagement in product refinement, refined analytical processes, targeted community outreach strategies, and customized sales services to secure long-term high-net-worth client retention and word-of-mouth growth. The holding operations model emphasizes stable cash flow and asset appreciation through sustained management. It shifts marketing focus from one-time sales to long-term operational services, with core processes centered on tenant acquisition, retention, and value enhancement. Analytical frameworks, promotional tactics, and service protocols are designed around tenant demographics and operational goals, while key performance metrics shift to rental occupancy rates, lease renewal rates, and tenant satisfaction levels.

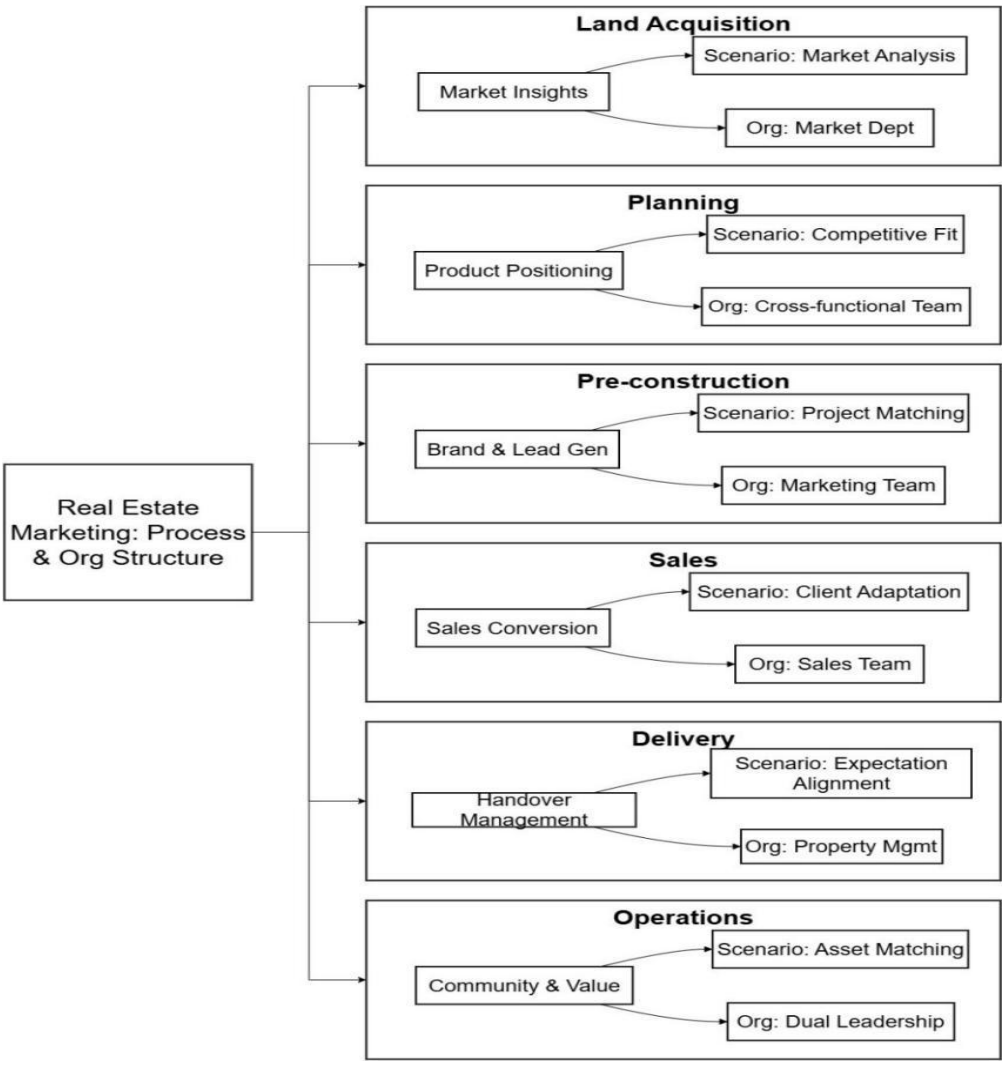

Figure 1.4- Full-process Adaptation and Organizational Needs

Source: Compiled and constructed by the author

The full lifecycle of real estate project development typically comprises five key phases: land acquisition, positioning, construction, market entry, and liquidation. Each phase has distinct operational objectives and marketing priorities, requiring seamless integration and dynamic coordination across stages. The diagram below illustrates the complete real estate marketing process from land acquisition to operational execution, clearly defining core marketing scenarios and responsible departments for each phase. This visual framework provides an intuitive understanding of how marketing processes align with organizational structures.

Table 1.5- Key Marketing Processes and Coordination Requirements at Each Stage of Project Development

Phase	Core business objective	Core focus of marketing process	Core connection requirements
Land acquisition phase	Accurate assessment of land parcel value and scientific decision-making for land acquisition	Regional market research and supply-demand analysis, customer segment demand forecasting, competitive landscape analysis, and value-to-return calculation	Export market analysis reports support land acquisition decisions, with survey data bridging the positioning phase.
Positioning phase	Transform market demand into product solutions and define the project's core positioning	Customer Group In-depth Research and Profiling, Project and Customer Group Positioning, Product Planning, Value System Construction, Pricing Strategy and Value Planning	Output positioning solutions to guide design implementation, value system alignment during construction phase promotion process
Construction phase	Advance project construction, complete brand warming-up and customer acquisition	Brand communication, integrated marketing promotion, event planning and customer acquisition, channel system establishment, on-site team formation, and launch plan development	Customer acquisition data is optimized for pricing and launch strategies, with engineering milestones synchronized with marketing rhythms to ensure seamless transition into the market entry phase.
Market entry phase	Achieve large-scale transactions and rapid cash recovery to complete core inventory clearance	Subscription launch, site conversion, channel management, pricing and sales control management, contract signing and payment collection	Adjust sales strategies dynamically based on transaction data, synchronize customer information to the CRM system, and integrate service processes.
Liquidation phase	Complete last-minute sales to maximize inventory	Formulation of end-of-day inventory clearance strategies, promotions and channel	Delivery processes collaborate with property management, with lessons

Phase	Core business objective	Core focus of marketing process	Core connection requirements
	value and build brand equity	incentives, customer referral programs and word-of-mouth marketing, delivery and after-sales services, as well as end-to-end process reviews	learned from reviews integrated into the enterprise standardization system.

Source: Compiled and constructed by the author

The marketing process should be proactively integrated during the initial planning phase to establish bidirectional feedback with design and planning efforts. During construction phases, it must align precisely with project milestones to ensure synchronization between marketing strategies and engineering timelines. In the completion and delivery phase, coordination with acceptance inspections and corrective actions should be strengthened to transform project handover into pivotal moments for word-of-mouth marketing. Additionally, process compatibility control checkpoints must be established to address core risks at each stage, complemented by a dynamic adjustment mechanism that enables marketing processes to adapt dynamically to project cycles and market conditions.

The integrated business process in real estate marketing breaks down internal functional barriers within enterprises, consolidating departmental resources around customer needs and marketing objectives. Its core lies in achieving seamless cross-departmental flow of information, business operations, and capital flows, effectively addressing issues such as departmental fragmentation, information silos, and inefficient collaboration inherent in traditional linear processes.

The core components of joint business processes are structured around six dimensions of cross-departmental collaboration, with key information details presented in Table 1.6. Information flow coordination serves as the cornerstone of these processes, as all cross-functional collaboration relies on efficient information circulation. This framework comprises three primary pathways: First, a forward demand information flow that enables seamless customer requirement transmission—from market research to implementation across design, engineering, and property management phases.

Second, a reverse feedback loop that channels sales data and customer insights from marketing channels back to design, engineering, and cost management units, facilitating dynamic product/service optimization. Third, an operational control information flow that synchronizes financial/cost data with marketing pricing strategies, expense allocations, and payment schedules in real-time, ensuring deep integration between marketing initiatives and project operational objectives.

Table 1.6 - Core Components of Integrated Business Process

Core Components	Core Content	Core collaboration requirements
target coordination	All departments coordinate their actions around the unified marketing strategy and operational objectives.	Jointly establish overall objectives, decompose departmental targets by phases, and establish a regular review and dynamic adjustment mechanism.
Collaboration	Break down functional barriers and establish a cross-functional collaborative organizational structure	Establish a cross-departmental task force, implement a collaborative meeting mechanism, and designate liaison officers and responsible personnel.
Information flow collaboration	Achieve real-time information sharing and seamless flow across the entire department, breaking down information silos	Real-time synchronization of core information across all departments and a unified information management platform
Process Node Coordination	Integrate business processes across departments and clarify key nodes and requirements for cross-departmental workflows	Create an end-to-end joint flowchart to clarify node inputs, outputs, responsible parties, and timelines
Distribution of rights and responsibilities	Clarify the boundaries of responsibilities, rights, and obligations among departments in cross-departmental collaboration.	Develop a collaborative authority and responsibility manual to clarify duties, rights, and accountability mechanisms at each stage
Performance Incentives	Establish a cross-departmental collaborative assessment and incentive mechanism to achieve interest alignment	Integrate overall objectives into performance evaluation systems and establish coordinated incentive mechanisms along with specialized reward and punishment mechanisms.

Source: Compiled and constructed by the author

The essence of BPR lies in fundamentally rethinking and radically redesigning business processes to achieve significant improvements in core performance metrics. In the real estate marketing sector, its primary application objective is to dismantle traditional "functional, linear, and fragmented" marketing processes, establishing a

new workflow system centered on customer value, cross-department collaboration, full-cycle closed-loop operations, and agile market responsiveness. Key pain points in conventional real estate marketing processes include: severe functional silos, linear and fragmented workflows; broken customer demand communication chains; rigid market responsiveness; pervasive information silos; and excessive non-value-added steps. Based on BPR theory, real estate marketing processes require three core transformations: First, transitioning from "functionality-oriented" to "process-oriented" approaches by reconstructing end-to-end collaborative workflows focused on customer value creation; Second, shifting from "serial linear processes" to "parallel engineering" through multi-department synchronization to significantly shorten cycle times and enhance product-market alignment (Hong Junhua, 2005); Third, evolving from "rigid fixed processes" to "agile responsiveness" by streamlining redundant approval procedures, establishing flat decision-making mechanisms, and accelerating market adaptation capabilities.

The optimization of integrated real estate marketing business processes adheres to the core principles of "customer value as the sole orientation, end-to-end process optimization as the core focus, cross-department collaboration as the foundation, digital empowerment as the support, and continuous iteration as the guarantee." The optimization process is completed through four phases: Phase 1 involves deconstruction, where a cross-department task force establishes existing process maps, conducts comprehensive diagnostics, and identifies non-value-added processes and collaboration bottlenecks (Fan Jinhai, 2002). Phase 2 focuses on restructuring, defining quantifiable optimization targets, fundamentally redesigning end-to-end core processes, streamlining approval workflows, and clarifying cross-departmental responsibilities and coordination points. Phase 3 emphasizes empowerment through digital platform deployment, organizational capacity building, and revamped performance incentive mechanisms to ensure efficient implementation of restructured processes. Phase 4 implements iterative improvements by establishing process KPI systems and regular evaluation mechanisms, creating a closed-loop iteration cycle of "design-execution-

monitoring-evaluation-optimization" to achieve continuous process refinement (Xu Xiangjin, 2016).

The marketing and business process management practices in the international real estate industry have provided diverse theoretical references and practical paradigms for industry development. The 4P theory (Product, Price, Place, Promotion) laid the theoretical foundation for modern real estate marketing systems, while the 4C framework (Consumer, Cost, Convenience, Communication) serves as the core support for customer lifecycle value management systems. Relationship marketing theory further clarifies the fundamental logic of customer lifecycle value management in the industry.

Advanced international practices have provided valuable process management insights for the industry. The U.S. real estate market has entered a highly mature era of existing home inventory, with core experiences including: a property and client sharing process centered on the Multiple Listing Service (MLS) system, a professionalized brokerage division of labor in marketing workflows, comprehensive compliance management across all processes, and a full-cycle service model focused on customer lifetime value. The German real estate market, characterized by long-term stability and a thriving rental sector, emphasizes: in-depth pre-market customer needs research, highly transparent sales processes, value-driven marketing strategies prioritizing sustainability, and refined operational marketing for rental housing. Canada's real estate market combines mature existing inventory with new development opportunities, featuring: integrated digital marketing across multiple channels, embedded consumer protection mechanisms throughout the process, and community-based experiential marketing tailored to specific scenarios. Poland, as an emerging market in Central and Eastern Europe, demonstrates expertise in: marketing processes combining fast turnover cycles with localized strategies, financial services seamlessly integrated into marketing workflows, and collaborative channel operations between foreign developers and local brokerage firms (Leszczynski & Olszewski, 2017; Melnychenko, 2022).

PropTech (Property + Technology) has become the core trend driving global real estate industry development. By leveraging big data, Artificial Intelligence (AI), Virtual Reality/Augmented Reality (VR/AR), and other technologies, it has fundamentally transformed the underlying logic and workflow systems of real estate marketing, achieving a fundamental shift from experience-driven to data-driven approaches, from manual operations to automation, and from linear processes to intelligent closed-loop systems (Kalliomaki, 2025; Tagliaro, 2025; Al-haimi, 2025; Siniak, 2020). The core restructuring of marketing processes manifests in six key aspects: market analysis and customer insight processes transitioning from experiential judgment to data-driven precision forecasting; promotional communication processes evolving from mass outreach to personalized targeted engagement; customer experience processes shifting from offline standalone interactions to immersive omnichannel integrated experiences; property site management and sales conversion processes transitioning from coarse management to intelligent precision control; channel management processes evolving from fragmented manual operations to platform-based omnichannel coordination; and customer relationship management processes advancing from single transaction maintenance to data-driven customer lifecycle operations.

The application of international experience in the Ukrainian market requires thorough consideration of local market characteristics and adherence to the core principles of "localized adaptation and phased implementation" (Biletskyi & Doroshenko, 2022; Adamov, 2025). Key features of Ukraine's real estate market include: being in an emerging development phase with significant regional disparities influenced by geopolitical factors, primarily driven by demand for small-sized housing units catering to essential needs; an underdeveloped regulatory framework resulting in insufficient market compliance; low mortgage penetration rates with cash payments remaining predominant; high internet adoption rates alongside nascent PropTech applications; market participants consisting mainly of local small-to-medium-sized

developers and decentralized brokerage agencies, lacking a nationwide property listing sharing system.

The most adaptable international practices for application in Ukraine's real estate market include: Germany's transparent sales processes and consumer protection systems, Poland's collaborative marketing model combining foreign developers with local agencies, PropTech-driven digital marketing frameworks, and the U.S. broker specialization system with standardized service protocols. However, implementation faces multiple challenges requiring localization adaptations: The MLS national property database system should adopt phased rollout starting with regional platforms; green building value marketing must prioritize structural safety and energy efficiency while gradually demonstrating long-term benefits; omnichannel digital marketing requires sequential implementation beginning with front-end digitalization before transitioning to back-end transaction digitization; customer lifecycle management needs to expand beyond property transactions to include localized community services and asset management scenarios. The comprehensive strategy should follow three phases: Phase 1 focuses on establishing institutional mechanisms addressing core market pain points; Phase 2 advances broker industry standardization and regional platform development; Phase 3 integrates proven omnichannel marketing and lifecycle customer management approaches while adapting to local geopolitical conditions, market demands, and regulatory environments to ensure solution feasibility and effectiveness (Denysenko, 2024; Motrenko & Sydorenko, 2024; Yang & Lishenko, 2024).

1.3 Methodology for Marketing Business Process Management in Real Estate Enterprises

The methodology for marketing business process management in real estate enterprises is grounded in BPM core theories, deeply tailored to the industry's characteristics of high value, long cycles, stringent regulatory oversight, and multi-

stakeholder collaboration. Centered on core objectives of "strategic implementation, efficiency enhancement, value creation, and risk control," it establishes a comprehensive management system encompassing logical frameworks, core methodologies, quantitative controls, and practical execution. This approach transcends traditional marketing management limitations of "result-oriented yet process-light" and "single-point-focused rather than systemic." Through standardized, lean, and digital process transformation, it achieves closed-loop management throughout the entire real estate marketing lifecycle, serving as a critical management tool for property developers to build core competitiveness in existing market competition.

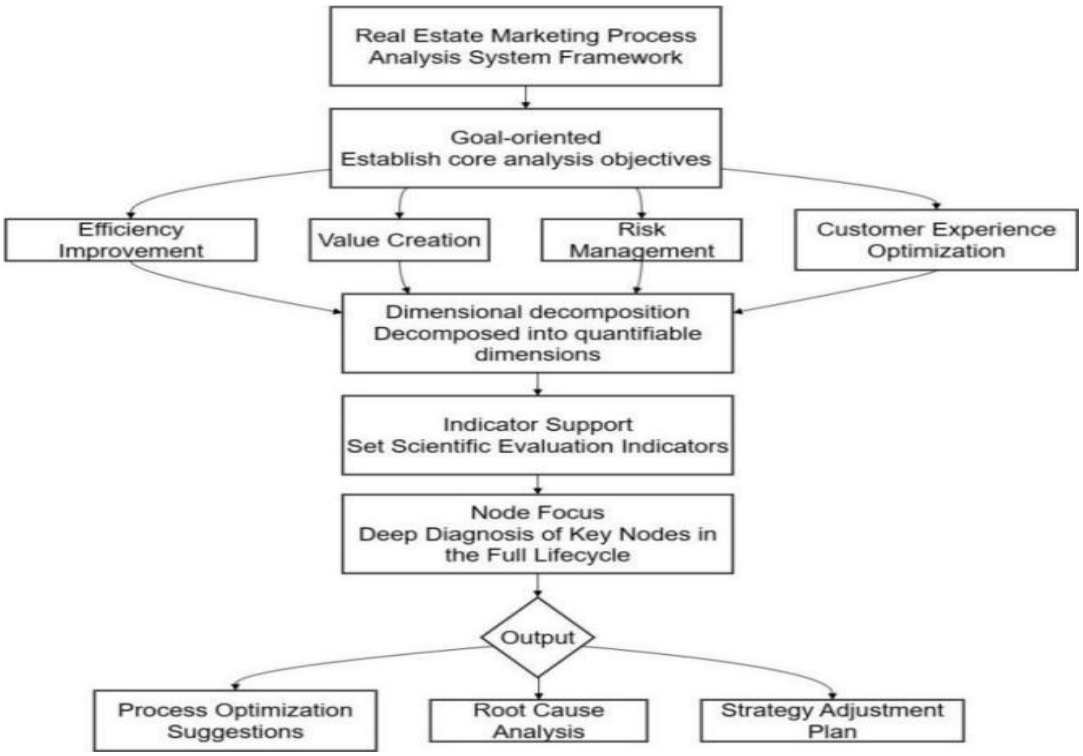

Figure 1.5- Framework of Real Estate Marketing Process Analysis System

Source: Compiled and constructed by the author

The system framework for analyzing real estate marketing processes adopts a goal-oriented approach. Through dimensional decomposition, indicator validation, and in-depth node diagnosis, it delivers actionable process optimization recommendations,

root cause analysis, and strategic adjustment plans, providing a systematic methodological framework for performance monitoring and diagnosis.

The theoretical foundation and practical value of BPM serve as the cornerstone for studying real estate marketing business processes. Xu Xiangjin (2016) proposed that Business Process Management represents a transformation methodology for converting function-centric traditional enterprises into process-centric modern organizations. By establishing editable and quantifiable business process models, it enables simulation analysis of operational bottlenecks and continuous optimization, while facilitating end-to-end lifecycle management from requirement analysis to process refinement. This approach ensures alignment between business operations and Information Technology (IT) systems, which aligns perfectly with the real estate industry's characteristics of multi-stakeholder collaboration and dynamic process variations. Zhou Yuguang (2008), building upon the Project Management Maturity Model and BPR theory, advocated for project management-centric governance reforms in real estate enterprises. He emphasized integrating management functions into unified process frameworks, eliminating information silos through standardization and digitalization, and achieving cross-departmental and cross-project collaboration. Hong Junhua (2005), from a speed competition perspective, introduced time-based business process reengineering logic. This methodology prioritizes resource allocation through process value-added rate analysis, eliminates non-value-added procedures, and reduces redundant time consumption, providing a core quantitative framework for optimizing marketing process efficiency.

The foundational logic of this methodology lies in establishing a closed-loop matching system comprising four elements: strategic anchoring direction, process-driven implementation, organizational support, and IT-enabled empowerment. These interconnected components address core challenges in real estate marketing management, including strategic execution gaps, process-organization misalignment, and disconnect between business operations and system integration. Strategy serves as the top-level anchor for process management, where a developer's overarching

development strategy directly determines the core objectives and design orientation of marketing processes. Large-scale expansion-oriented developers should build standardized, replicable process systems; premium boutique developers need to strengthen customer value delivery and customized service offerings; while regionally-focused developers must enhance localized adaptation capabilities. Strategic-process misalignment remains the root cause of superficial process optimization. Processes act as the core vehicle for strategy implementation, requiring marketing objectives to be broken down into actionable, controllable, and quantifiable steps across the entire workflow. End-to-end process design breaks down departmental silos, connects all marketing stages, and ensures seamless strategic goal transmission from top management to frontline teams. Organizations provide essential support for process execution, necessitating corresponding organizational structures, role definition, position allocation, and performance evaluation systems. Establishing process ownership mechanisms clarifies accountability and collaboration boundaries, while cross-functional teams address departmental coordination inefficiencies. Organizational structures must transition from "functionality-oriented" models to "process-oriented" frameworks. IT serves as the digital enabler for process efficiency, achieving standardized process implementation, real-time data flow, dynamic performance monitoring, and automated execution through IT system development. System construction must be deeply aligned with process design, leveraging data capabilities to provide decision support for continuous process optimization, thereby establishing a digital closed loop in process management. The diagram below illustrates the complete closed loop for marketing strategy execution and optimization: from setting process metrics, designing and optimizing processes, executing workflows, to end-to-end performance monitoring, strategic effectiveness evaluation, and subsequent variance analysis and adjustments. This demonstrates how strategies are implemented through processes and continuously refined via monitoring feedback, embodying the core logic of strategic execution via process implementation and

feedback-driven optimization. This closed loop specifically exemplifies the synergistic interaction among four key elements: strategy, processes, organization, and IT.

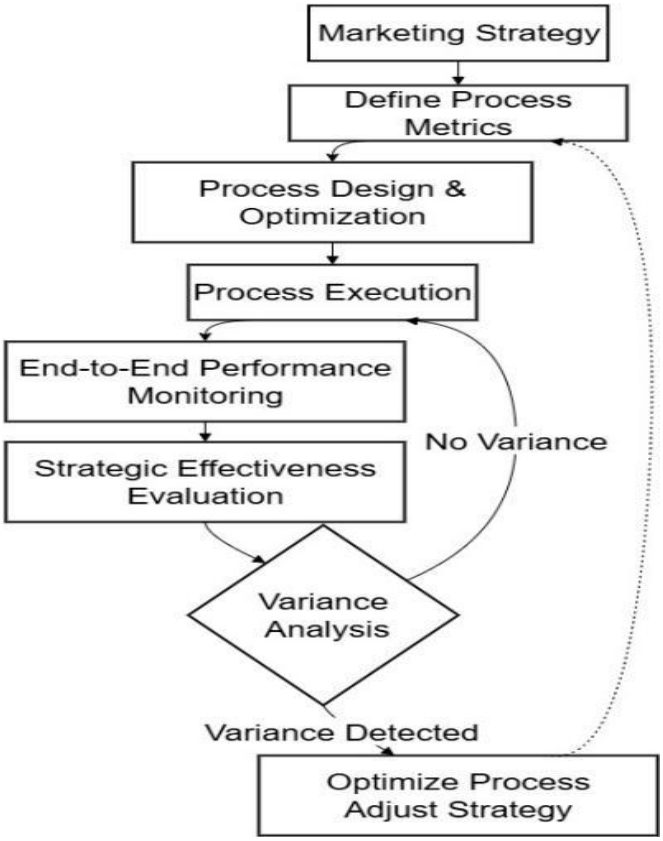

Figure 1.6- Closed Loop of Marketing Strategy Execution and Optimization

Source: Compiled and constructed by the author

Based on the core objectives of marketing process management, this study establishes four key evaluation dimensions: efficiency, effectiveness, adaptability, and compliance. These dimensions serve as both the fundamental guidelines for process design and the core benchmarks for performance evaluation, forming a four-dimensional control system characterized by "efficiency as the foundation, effectiveness as the core focus, adaptability as the safeguard, and compliance as the baseline." The efficiency dimension centers on cycle duration and cost control, representing the foundational goal of marketing process management. Its core objective is to shorten cycles and reduce costs through process standardization and optimization. Key evaluation metrics include total process duration, customer acquisition cost per unit, and marketing expenditure ratio. The underlying logic

involves eliminating non-value-added processes through strategic design to achieve cost reduction and efficiency enhancement. The effectiveness dimension prioritizes conversion rates and customer satisfaction, focusing on how processes drive marketing outcomes. Critical evaluation indicators encompass end-to-end conversion rates, customer satisfaction scores, and referral rates from existing clients. This approach adheres to a customer-centric philosophy, embedding value delivery across all touchpoints to ensure sustained marketing performance improvement (Xue Xiaolei, 2009; Zeithaml, 1996). The adaptability dimension emphasizes responsiveness to market and policy changes, serving as a critical guarantee for process sustainability. Grounded in contingency management theory, key evaluation metrics include response time to policy and market shifts and process modularization capabilities. The core strategy involves building an elastic architecture combining "standardized infrastructure with modular components," enabling rapid adaptation to external environments through agile design methodologies. The compliance dimension centers on end-to-end risk management as the fundamental baseline for process governance. Rooted in comprehensive risk management theory, its core evaluation metrics include compliance risk coverage rates and incident occurrence frequencies. The core methodology involves embedding compliance controls throughout all phases—pre-event, during-event, and post-event—to establish a closed-loop compliance framework that mitigates legal and operational risks across the entire marketing lifecycle (Liu Yun, 2009).

Based on the underlying logic and core dimensions outlined above, this study establishes a "Three-Level Five-Stage" top-level design framework for real estate marketing business process management, achieving end-to-end closed-loop management from strategic planning to frontline execution. The vertical structure comprises three control tiers: The strategic tier defines the positioning, core objectives, and medium-to-long-term planning for marketing process management, serving as top-level guidance; The control tier establishes standardized processes, responsibility allocation, performance evaluation systems, risk management mechanisms, and

continuous optimization frameworks, acting as the critical nexus between strategy and execution; The execution tier breaks down control requirements into specific operational protocols, phased objectives, and implementation tools for the entire marketing lifecycle. Horizontally, the framework covers five integrated phases spanning the entire marketing lifecycle: The Pre-Planning Phase includes market research, customer profiling, project positioning, and marketing strategy formulation, prioritizing precise positioning and strategic soundness; The Promotion & Lead Acquisition Phase involves strategy development, channel management, content creation, and lead generation strategies, focusing on enhancing customer acquisition efficiency and compliance risk control; The Launch & Conversion Phase encompasses pricing strategy formulation, project rollout, on-site conversion, contract execution, and down payment collection, emphasizing conversion rate optimization, transaction compliance, and financial security; The Delivery & Fulfillment Phase covers contract registration, mortgage processing, final payment collection, property handover, and title registration procedures, ensuring delivery fulfillment and customer satisfaction; The Post-Sales Maintenance Phase includes complaint resolution, community engagement, existing client retention, and reputation management, prioritizing service responsiveness and maximizing customer lifecycle value. The framework ensures strategic alignment with execution through a vertical three-tier structure, implements end-to-end closed-loop management via horizontal five-stage processes, and conducts continuous evaluation and optimization using four core dimensions as benchmarks. This ultimately forms a complete methodological closed loop encompassing "strategic guidance - process implementation - organizational support - IT empowerment - performance evaluation - continuous optimization".

In practice, real estate developers still face numerous challenges in marketing process management. Zhang Yao (2023) pointed out that current digital infrastructure development lacks unified planning, with departments creating "information silos." Marketing processes fail to effectively integrate with investment, engineering, and financial operations, resulting in low cross-departmental collaboration efficiency.

Zhou Yuguang (2008) noted that under traditional functional structures, marketing processes are fragmented across departments. Management focuses on single-department efficiency while neglecting end-to-end optimization, leading to redundant approvals and delayed market responsiveness. Gong Guohua (2005) emphasized that excessive non-value-added steps in processes prolong project timelines and hinder rapid market adaptation. Liu Ying (2009) highlighted that most developers still adopt a "product-centric" approach in marketing processes, weakening customer information tracking and value discovery. These pain points underscore the necessity of establishing systematic marketing process management methodologies.

The implementation of marketing process management in real estate enterprises must be grounded in standardized modeling tools and anchored in lean, agile, and continuous improvement management principles. This approach establishes a dual-core methodology system characterized by "tool-based standardization and mindset-driven optimization," ensuring both process standardization and stability while enabling continuous iteration and dynamic adaptation.

Process modeling and standardization form the foundation of marketing process management. The core approach involves using standardized modeling languages and tools to transform abstract marketing processes into visualized, executable, controllable, and optimizable models. This methodology clarifies boundaries, responsibilities, actions, input/output relationships, and collaboration dynamics across operational stages, effectively addressing critical challenges in real estate developers' marketing processes such as ambiguous accountability, inefficient coordination, inconsistent standards, and implementation deviations. Among industry standards, Business Process Model and Notation (BPMN) stands as the most widely adopted international framework for process visualization. Its key advantage lies in providing standardized graphical symbols that are easily comprehensible to both business professionals and technical teams, while meeting the collaborative management needs of multi-departmental and multi-role participation in marketing workflows (Xu Xiangjin, 2016). In real estate marketing management, BPMN enables visual process

representation with clearly defined accountability boundaries, digital storage and iterative optimization capabilities, as well as seamless integration with IT system development. Architecture of Integrated Information Systems (ARIS) focuses on establishing a comprehensive analytical framework for process management from an enterprise-wide perspective. As a core tool for top-level design and systematic control of marketing processes, it facilitates strategic alignment with operational workflows, enables multidimensional systematic analysis, and achieves integrated management of process performance and risk control. In real-world applications by property developers, these two tools are typically employed in complementary ways: ARIS facilitates top-level architecture design and strategic alignment, while BPMN enables modeling, implementation, and system integration for specific execution processes, thereby establishing a comprehensive modeling and standardization framework.

The management philosophies of Lean, Agile, and continuous improvement provide core methodological support for the ongoing optimization and dynamic adaptation of marketing processes, serving as the essential foundation for maintaining process vitality. The essence of Lean philosophy lies in identifying and eliminating all non-value-adding activities (i.e., "waste") through value stream analysis, thereby creating maximum value for customers with minimal resource input. In real estate marketing process management, its core application revolves around customer value, utilizing value stream analysis to precisely identify and eliminate seven key wastes: ineffective waiting time, redundant procedures, inefficient promotion efforts, inventory overstocking, defective product rework, redundant operations, and material transfer inefficiencies. This ultimately achieves the goal of "maximizing customer value while minimizing process waste." The four time compression methods proposed by Hong Junhua (2005) in marketing process management exemplify the practical application of Lean principles in temporal dimensions. Agile methodology focuses on iterative development, cross-functional team collaboration, and rapid response to customer needs, effectively addressing uncertainties in requirements and environments. These approaches align perfectly with the real estate industry's characteristics of stringent

policies and high volatility. Key implementations include building cross-functional agile marketing teams, adopting iterative marketing process management, and establishing rapid customer feedback mechanisms, significantly enhancing marketing processes' responsiveness to market changes. The essence of Kaizen (Continuous Improvement) lies in "gradual advancement, continuous iteration, and full participation." By leveraging daily incremental improvements from all employees, it achieves long-term enhancement of process management capabilities, serving as the core mechanism for sustainable process optimization. Key applications include establishing a participatory improvement proposal system, implementing regular process review and refinement mechanisms, and creating knowledge accumulation and replication frameworks for process optimization, thereby ensuring continuous process refinement and outcome solidification. In summary, lean methodology addresses the challenge of "maximizing value and minimizing waste," agile approaches tackle the need for "rapid response and dynamic adaptation," while Kaizen establishes an intrinsic mechanism for "ongoing optimization and sustained iteration." These three complementary approaches, synergizing with process modeling tools, enable comprehensive lifecycle management of marketing processes encompassing standardization, optimization, iteration, and institutionalization.

The implementation effectiveness of real estate marketing business process management must be evaluated, monitored, and diagnosed through a quantifiable indicator system. Quantitative management serves as the critical bridge connecting process design with execution outcomes. By establishing scientific KPI, customer acquisition funnel management models, and comprehensive performance monitoring mechanisms, marketing processes can transition from "experience-based management" to "data-driven management." This approach enables precise identification of process bottlenecks and provides data-driven support for targeted optimization.

Centered on four core dimensions of marketing process management, we have established a KPI framework structured around the "input-output-conversion-value" axis, categorized into four major types to comprehensively address quantitative control

needs throughout the marketing lifecycle. The first category comprises cost-efficiency metrics focusing on process efficiency, including Cost Per Lead (CPL), Customer Acquisition Cost (CAC), lead conversion rate, and marketing budget approval rate, which precisely measure customer acquisition efficiency and cost control effectiveness. The second category covers conversion effectiveness metrics emphasizing process outcomes, featuring a full-chain conversion rate system spanning exposure, lead generation, website visits, subscription sign-ups, and contract closures, alongside Customer Satisfaction (CSAT), Net Promoter Score (NPS), and customer referral rates to holistically evaluate conversion capabilities and customer value delivery. The third category includes return on investment metrics assessing overall process performance, with key indicators such as Return on Investment (ROI), Return on Marketing Investment (ROMI), and marketing expense ratio to evaluate ROI and return on marketing investments. The fourth category focuses on operational control metrics addressing adaptability and compliance, encompassing policy/market response timelines, marketing campaign execution cycles, compliance risk incident rates, complaint resolution timeliness and resolution rates, as well as dynamic process adaptation capabilities and risk mitigation capabilities.

Building a full-process funnel analysis model based on real estate marketing customer decision paths - "traffic (exposure)→leads (data retention)→visits→ reservations→signings→payments"—serves as the core tool for quantified marketing process management. This model decomposes the entire marketing workflow into funnel stages, utilizing key metrics such as conversion rates, retention rates, and churn rates at each phase to identify operational bottlenecks and optimize process efficiency. The core correlations and control indicators are detailed in Table 1.7.

Table 1.7- Correspondence between funnel hierarchy and process flow

Funnel hierarchy	Corresponding marketing process	Core control indicators
Flow layer	Customer acquisition promotion process	Exposure volume, Cost Per Mille (CPM)
Clue layer	Clue cultivation process	Effective lead rate, CPL, Exposure-to-lead conversion rate
Visit layer	Invitation Reception Process	Visitor count, Lead-to-Visit conversion rate
Subscription tier	Site conversion process	Subscription volume, visit-to-subscription conversion rate
Contracting layer	Contract signing process	Signing volume, pre-subscription to signing conversion rate
Collection layer	Recovery Management Process	Amount recovered, recovery rate, and recovery cycle

Source: Compiled and constructed by the author

The core analytical framework and application methods of the funnel model encompass: Identifying process weaknesses through horizontal benchmarking against industry leaders and internal corporate standards; Digging into root causes of low conversion rates by vertically decomposing sub-indicators; Analyzing metric fluctuations through dynamic trend monitoring integrated with market and marketing activity changes; Implementing process optimization through reverse-driven optimization based on churn analysis - ultimately achieving a strategic transition from "holistic outcome management" to "process-level operational control".

Building a three-step performance monitoring and diagnostic framework based on core KPI metrics and customer conversion funnel models - comprising "real-time dashboard monitoring, multi-dimensional diagnostic analysis, and closed-loop optimization implementation" - serves as the cornerstone for implementing quantitative management. The first step involves creating a KPI dashboard through business intelligence (BI) systems that visualizes core metrics, funnel conversion rates, process efficiency, and compliance risk data in real-time. Views are designed with hierarchical structure for different management levels, featuring threshold-based anomaly alerts for key indicators to transition from post-event reviews to real-time control and proactive

warnings. The second step entails conducting diagnostic analysis across four dimensions - process stages, organizational entities, external environments, and system infrastructure - to pinpoint root causes of anomalies. The third step establishes a closed-loop management mechanism encompassing "monitoring, alerts, diagnosis, optimization, review, and re-monitoring" clearly defining responsible parties, implementation timelines, and expected outcomes for optimization plans. Continuous monitoring of optimization effectiveness allows validated measures to be updated into process standards and institutionalized through IT systems, driving sustained improvement in marketing process performance.

The successful implementation of methodology for marketing business process management in real estate enterprises requires establishing a system implementation framework tailored to corporate realities, adhering to scientific implementation pathways, and leveraging digital tools to solidify, automate, and enhance intelligent process upgrades. It is essential to clarify the adaptability principles and boundary conditions for methodology application, ensuring the process management system aligns with the evolving needs of enterprise development.

The implementation of methodology for real estate marketing business process management must adhere to four adaptive principles while thoroughly considering three core boundary conditions to achieve deep alignment between universal methodologies and corporate-specific needs. The four adaptive principles include: Strategic Alignment Principle - Process management system design must be thoroughly aligned with the company's overall development strategy and marketing strategy, with differentiated process design orientations corresponding to varying development strategies among real estate enterprises; Customer-Centric Principle - Process system design must prioritize customer needs and experiences over internal management convenience, with all process optimization metrics evaluated based on customer value creation; Authority-Responsibility Matching Principle - Process implementation requires clear division of responsibilities, ensuring one-to-one correspondence between process stages and accountable entities while maintaining

proper alignment between authority and responsibility, supported by corresponding performance evaluation systems; Dynamic Adaptability Principle—Process systems must establish continuous optimization mechanisms capable of rapid adjustments in response to policy changes, market dynamics, customer demands, and corporate development stages. The three core boundary conditions are as follows: 1) Enterprise scale boundaries: Leading real estate developers must establish systematic, standardized closed-loop processes; mid-sized regional developers should adopt a "standardized framework + localized adaptation" approach; small developers should implement streamlined, flat-process designs focusing on core operational controls. 2) Project type boundaries: Residential projects targeting first-time buyers and home upgrades prioritize customer acquisition efficiency and standardized services, while luxury residences and commercial properties emphasize in-depth client cultivation and customized solutions, reducing reliance on standardized assembly-line processes. 3) Market environment boundaries: In seller's markets, process design focuses on client screening, pricing control, and payment collection efficiency; in buyer's markets, emphasis shifts to channel expansion, targeted customer acquisition, enhanced client experience, and process agility optimization.

Using the five-stage framework of the marketing full lifecycle process, we identify Key Control Points (KCPs) within marketing workflows. These nodes serve as critical drivers for process execution, risk management, and performance outcomes, while also constituting primary focus areas for process analysis, optimization, and control. Detailed information on key control points and core management requirements for each stage is provided in Table 1.8.

Table 1.8- Critical Control Points and Control Requirements for Each Stage of the Marketing Process

Process Phase	Critical control point	Core control objectives	Core control requirements
Pre-Planning Phase	Project Positioning and Marketing Master Plan	Ensure precise positioning and scientifically sound strategy	Based on market and customer data, a three-level approval process and multi-department collaborative review are implemented.

Process Phase	Critical control point	Core control objectives	Core control requirements
	Approval		
	Approval of total marketing budget	Manage overall marketing investment	Based on inventory value and turnover cycle, clearly define accounts and control rules, with dual department review by marketing and finance.
Customer Acquisition Promotion Phase	Marketing content compliance review	Prevent compliance risks in publicity	100% legal review of external content, strict compliance red-line control, and establishment of traceable audit records
	Channel Access and Settlement Approval	Controlling Channel Costs and Cooperation Risks	Establish a tiered channel access system with multi-department joint review of cooperation terms and closed-loop control for settlement execution
	Marketing Campaign Plan and Expense Approval	Enhance the input-output ratio of activities	Define activity objectives, budget, and expected outcomes, implement tiered approval processes, and conduct post-evaluation reviews for ROMI
Opening Transition Phase	Price Strategy and Discount Plan Approval	Stabilize the price system	Based on market and sales data analysis, implement a "one property, one price" approval and disclosure system, with clearly defined discount authority.
	Commercial Housing Subscription and Contract Signing Control	Ensure transaction compliance	Utilize standardized contract templates, conduct legal review of special clauses, and perform pre-approval of home purchase qualifications
	Control of Home Purchase Funds Recovery	Ensure fund security and payment efficiency	The full purchase amount is deposited into a supervised account, with a time-limited follow-up mechanism established for fund recovery. Collaborative efforts with banks are implemented to shorten the loan disbursement cycle.

Process Phase	Critical control point	Core control objectives	Core control requirements
Performance Delivery Phase	Delivery Plan and Risk Screening Approval	Defense against delivery risk	Comprehensive risk identification and rectification before delivery, with multi-department joint review of plans and emergency response plans
	Customer Property Certificate Processing Flow Control	Ensure timely processing of property certificates	Define process nodes, timelines, and responsible parties, establish a collaboration mechanism, and synchronize progress in real time
Post-sales maintenance phase	Closed-loop management of customer complaint resolution	Quickly mitigate complaint risks	Establish a first-contact responsibility system and time limit standards, activate emergency response plans for major complaints, and conduct follow-up visits to ensure closed-loop management after resolution.
	Customer Maintenance and Referral Process Management for Long-Term Clients	Unlock customer value across the entire lifecycle	Establish a tiered operation and maintenance system, standardize and transparentize referral policy processes, and implement closed-loop follow-up throughout the entire workflow.

Source: Compiled and constructed by the author

The optimization implementation of real estate marketing business processes must adhere to the principles of "problem-oriented approach, phased execution, incremental advancement, and continuous iteration," progressing steadily through a four-step implementation roadmap to avoid operational disruptions and execution resistance caused by one-size-fits-all process restructuring. Step 1: Problem Identification focuses on pinpointing core issues and inefficient processes through end-to-end audits, multidimensional pain point analysis, and data-driven diagnostics, followed by prioritizing optimization targets. Step 2: Solution Design involves developing targeted process optimization plans through benchmarking industry best practices and cross-functional innovation workshops, detailing process standards, responsibility allocation, and implementation roadmaps while conducting risk assessments and contingency planning. Step 3: Pilot Implementation selects 1-2

representative projects/regions for small-scale trials, validating solution feasibility within 1-3 months. Based on implementation feedback, iterative optimizations refine the final scalable version. Step 4: Full-Scale Deployment emphasizes company-wide adoption of optimized processes through institutional embedding, IT system integration, and performance-linked evaluations to ensure long-term sustainability. Concurrently, a continuous improvement mechanism is established to create a closed-loop system for ongoing process management enhancement.

The digital implementation of real estate marketing process management requires leveraging end-to-end marketing automation tools and technical systems to achieve online transformation, automation, and intelligent upgrades. This ultimately establishes a comprehensive digital tool matrix covering "customer management-resource integration-data-driven decision-making-marketing execution," serving as the core foundation for digital transformation in property developers' marketing processes. The CRM system acts as the fundamental platform for digital marketing workflows, delivering three core functionalities: end-to-end customer lifecycle management, sales automation, and marketing campaign management.

Conclusion to the Section 1

BPM (Business Process Management) represents a systematic strategic management paradigm centered on customer value creation and enterprise strategy implementation, rather than mere process reengineering or localized improvements. Its theoretical evolution follows a complete trajectory, tracing back to Adam Smith's labor division theory, refined through Taylor's scientific management practices and Ford's assembly line innovations. The breakthrough occurred in the 1990s via BPR, ultimately forming a dynamic management system covering the entire process lifecycle. At its core, BPM dismantles functional silos by focusing on end-to-end cross-functional processes. Through data-driven quantitative modeling, process restructuring, and continuous iteration, it achieves seamless internal-external collaboration. Unlike BPR's radical one-time restructuring, BPM balances incremental optimization with

transformative innovation, delivering significant improvements in key performance indicators through closed-loop lifecycle management. Essentially, BPM transcends traditional labor division theory by preserving the efficiency advantages of specialized specialization while overcoming industry-wide challenges of functional barriers and process fragmentation.

The real estate industry's six core characteristics - immobility, durability, capital intensity, heterogeneity, policy sensitivity, and regional specificity - fundamentally determine the uniqueness and design boundaries of marketing processes. Immobility necessitates establishing a three-tier value transmission system encompassing "regional value, plot value, and project value," with scenario-based experiences breaking down product perception barriers. Durability and extended decision cycles require processes that cover the entire customer decision chain, incorporating compliance reviews and commitment tracking mechanisms. Capital intensity demands processes anchored to rapid cash flow objectives, closely coordinated with funding plans and financing arrangements. Heterogeneity calls for differentiated value discovery and a "per-household pricing" precision pricing system. Policy sensitivity mandates processes embedded with policy tracking and compliance review checkpoints. Regional specificity requires a three-tier management framework integrating "headquarters coordination, regional adaptation, and project implementation." Guided by these constraints, marketing process design must adhere to four principles: customer orientation, strategic alignment, compliance foundations, and flexible collaboration, while comprehensively addressing six key aspects: upfront planning, localization, systematic integration, compliance adherence, collaborative execution, and data-driven optimization.

The marketing business processes of real estate enterprises can be systematically categorized into two major types: core marketing processes and supporting support processes, which collectively form a complete value creation and realization system. The core marketing processes serve as the main thread for value realization, encompassing five key categories: analytical processes provide decision-making

foundations for the entire workflow, including market research, competitor benchmarking, customer profiling, and demand forecasting; product management processes transform customer needs into product value, covering critical stages such as project positioning and product planning; promotion processes ensure precise delivery of project value; sales processes guarantee the achievement of sales targets and cash flow objectives; service processes sustain brand value and facilitate asset accumulation. Supporting support processes include three major components: CRM systems, digital marketing management, and customer acquisition management, which provide data, system, and efficiency support for core processes. These two process systems achieve efficient collaboration through seamless cross-departmental information flow, business processes, and capital flows, ultimately forming an end-to-end closed-loop management system that covers the entire marketing lifecycle.

The foundational logic of real estate marketing business process management methodology lies in establishing a closed-loop system comprising four interdependent elements: strategic anchoring direction, process-driven implementation, organizational support, and IT-powered empowerment. These components work synergistically to systematically address core pain points in property developers' marketing management, including strategic execution gaps, process-organization misalignment, and disconnect between business operations and system integration. Strategy serves as the top-level anchor for process management, requiring differentiated design approaches tailored to different development strategies - scale-expansion-focused developers prioritize standardized replicable processes, while premium boutique developers emphasize customer value delivery and customized services. Processes act as the core vehicle for strategy implementation, necessitating decomposition of marketing strategies into actionable, controllable, and quantifiable operational steps. Organizations provide essential support for process execution by clarifying accountability responsibilities and collaboration boundaries, driving organizational transformation from function-oriented structures to process-driven frameworks. IT delivers digital empowerment for process efficiency through system architecture that solidifies workflows, facilitates data flow,

and enables automated execution. Through coordinated synergy of these four elements and the "Three Levels, Five Stages" top-level design framework, comprehensive closed-loop management is achieved from strategic planning to frontline implementation.

Guided by the core objectives of marketing process management, the industry has established four fundamental evaluation dimensions: efficiency, effectiveness, adaptability, and compliance, forming a four-dimensional governance framework characterized by "efficiency as the foundation, effectiveness as the core, adaptability as the safeguard, and compliance as the baseline." The efficiency dimension focuses on cycle duration and cost optimization through standardized processes, reducing end-to-end workflows while lowering customer acquisition costs and marketing expenditure ratios. Its core principle involves eliminating non-value-added activities to achieve cost reduction and operational efficiency. The effectiveness dimension prioritizes conversion rates and customer satisfaction, monitoring full-channel conversion performance, client satisfaction metrics, and repeat customer referral rates. This approach centers on customer-centric strategies that embed value delivery across all touchpoints. The adaptability dimension emphasizes responsiveness to market and policy changes, leveraging contingency management theory through an elastic architecture combining "standardized infrastructure and modular components" to enable rapid environmental adaptation. The compliance dimension focuses on end-to-end risk control, integrating regulatory compliance into every process stage based on comprehensive risk management principles to mitigate legal and operational risks. These four dimensions serve as both the fundamental guidelines for process design and key benchmarks for performance evaluation, collectively supporting continuous optimization and dynamic adaptation of marketing processes.

The implementation of marketing process management in real estate enterprises must be grounded in three core management philosophies: lean, agile, and continuous improvement, forming a dual-core methodology system characterized by "standardized tool implementation and mindset-driven optimization." The essence of lean thinking

lies in value stream analysis, which precisely identifies and eliminates seven critical waste categories - including inefficient waiting periods, redundant procedures, and ineffective promotions - to ultimately achieve the core objectives of "maximizing customer value and minimizing process waste." Agile methodologies emphasize iterative development, cross-functional collaboration, and rapid response to client needs, effectively adapting to the real estate industry's policy-intensive and highly volatile environment. By establishing cross-functional agile marketing teams and implementing rapid customer feedback mechanisms, process response speeds are significantly enhanced. Continuous improvement focuses on "gradual advancement, iterative refinement, and full-staff participation," achieved through employee-driven improvement proposals, regular process reviews, and knowledge replication systems to ensure sustained process management excellence. These three pillars complement process modeling tools, collectively enabling comprehensive lifecycle management of marketing processes through the "standardization-optimization-iteration-consolidation" cycle.

The effectiveness of real estate marketing process management must be evaluated, monitored, and diagnosed through quantifiable metrics to drive a fundamental shift from "experience-driven" to "data-driven" marketing strategies. Centered around four core dimensions, the industry has established a KPI system structured around the "input-output-value" framework, comprehensively covering four categories: cost efficiency, conversion effectiveness, return on investment, and operational control, enabling quantitative management across the entire marketing lifecycle. A full-process funnel analysis model based on customer decision paths - "traffic→leads→visits→subscriptions→signings→payments" - uses conversion rates, retention rates, and churn metrics at each stage to break down process efficiency and pinpoint bottlenecks. Building on this foundation, the industry has developed a three-step performance monitoring mechanism: "real-time dashboard tracking→multidimensional diagnostic analysis→closed-loop optimization implementation." This system incorporates KPI dashboards for anomaly alerts, multi-

dimensional root cause analysis, and ultimately establishes a closed-loop management cycle of "monitoring→early warning→diagnosis→optimization→ review→re-monitoring," ensuring continuous improvement in marketing process performance.

The successful implementation of methodology for marketing process management in real estate enterprises must strictly adhere to four adaptive principles: strategic alignment, customer-centric approach, responsibility matching, and dynamic adaptation. Simultaneously, it requires comprehensive consideration of three core boundary conditions: enterprise scale, project types, and market environment, while advancing steadily through the principles of "problem-oriented approach, phased implementation, incremental progress, and continuous iteration." The implementation roadmap consists of four key phases: 1) Problem Identification Phase: Identifying core process issues through end-to-end audits, multidimensional pain point collection, and data-driven diagnostics; 2) Solution Design Phase: Developing targeted process optimization plans via industry benchmarking and cross-functional innovation workshops; 3) Pilot Implementation Phase: Conducting small-scale validation through selected pilot projects and refining solutions based on implementation feedback; 4) Full-Scale Deployment and Institutionalization Phase: Embedding processes into organizational systems, integrating IT infrastructure, and linking performance metrics to ensure sustainable process implementation. For digital support, leveraging CRM, ERP, and other digital tools is essential to achieve digital transformation in marketing process management.

SECTION 2
DIAGNOSIS OF MARKETING BUSINESS PROCESS MANAGEMENT IN REAL ESTATE ENTERPRISES

2.1 Current Situation and Development Trend of Real Estate Industry under the Condition of Economic Globalization

Economic globalization has reshaped the development environment of the real estate industry through cross-border flows of capital, technology, policies, and markets. As a unique sector with both physical and financial attributes, the real estate industry exhibits environmental characteristics of "global interconnectivity, multidimensional interweaving, and dynamic evolution," which can be summarized into five key dimensions.

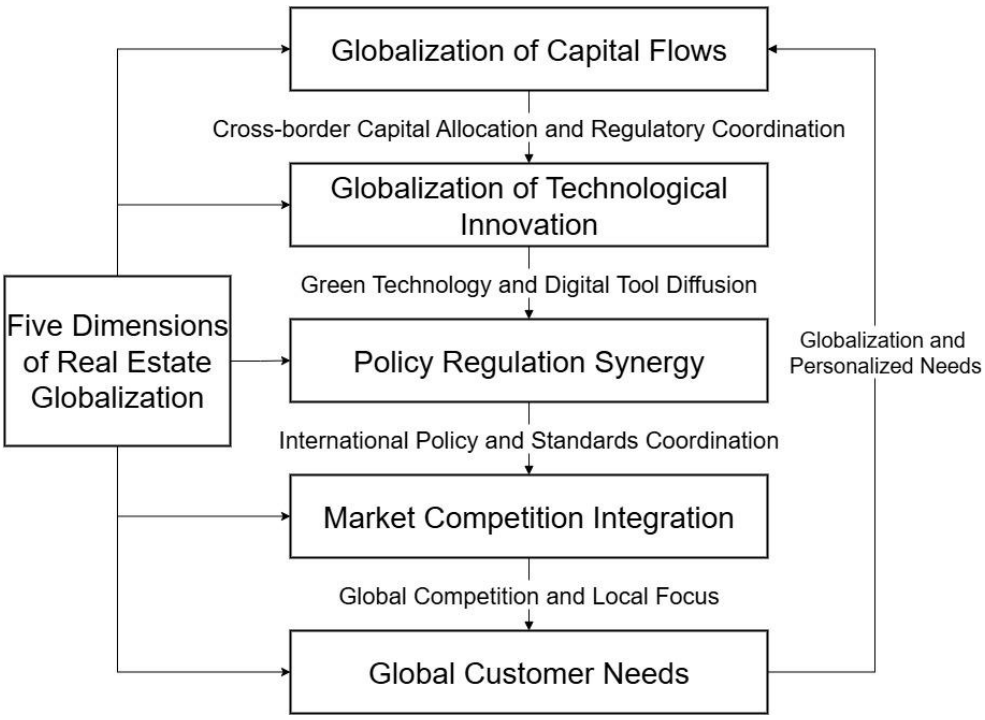

Figure 2.1- Schematic diagram of five dimensions of real estate globalization

Source: Compiled and constructed by the author

The globalization of capital flows signifies a fundamental transformation, with real estate capital breaking national boundaries to achieve optimal allocation. The

pursuit of high-quality assets and the demand for risk diversification constitute the core logic behind cross-border capital movements. Huang Hao (2024) noted that globalization has driven real estate developers to adopt diversified financing strategies, optimizing capital structures through Real Estate Investment Trusts (REITs) and cross-border mergers and acquisitions. Chen Zhuyue (2023) highlighted that cross-border REITs and green bonds have significantly increased the proportion of overseas financing for leading real estate firms, rising from 17% in 2018 to 34% in 2023.

Technological innovation is reshaping global production factors and operational models. The cross-border dissemination of green technologies is driving a shift in global real estate valuations toward an "ecological value orientation," with Building Information Modeling (BIM) technology becoming standard equipment for large-scale projects. Internationally, green technologies are gaining wider adoption through the Leadership in Energy and Environmental Design (LEED) certification system. Wang Xin (2025) revealed that leading real estate developers enhance full-cycle project management efficiency through BIM and digital twin technologies, establishing technological barriers. Yang Zhidong (2025) demonstrated that digital transformation reduces project development cycles by 28% for top-tier developers while boosting cross-border collaborative design efficiency by 45% via BIM technology. Zhao Xiaodan and Hu Qiguang (2024) noted that after implementing the "14th Five-Year Plan for Building Energy Efficiency and Green Building Development," projects compliant with green building standards saw a 32% increase in policy loan eligibility rates.

Policy regulation coordination has driven countries to shift from "isolated regulation" to "collaborative governance". Under the framework of the Paris Agreement, multiple nations have set carbon reduction targets for the real estate sector, while the EU and China have successively established clear green building standards. Environmental, Social and Governance (ESG) factors have become core variables in policy-making, accelerating policy coordination through globalization. The increase in cross-border real estate activities has promoted regulatory coordination, with China

and ASEAN collaborating on digital platforms for engineering and construction standards. Some EU regulations require disclosure of cross-border economic activity data, indirectly affecting the transparency of cross-border real estate transaction information and leading to significant policy spillover effects. Lü Mengyao (2024) pointed out that international investors 'evaluation of real estate companies has shifted from single financial indicators to comprehensive ESG performance, but domestic real estate firms commonly face issues of inaccurate ESG disclosure and outdated concepts. Tan Haoqi et al. (2025) found through data analysis of A-share listed real estate firms that 38% adopted passive ESG disclosure strategies, resulting in international financing cost premiums of 1.8-2.5 percentage points. Lu Hao and Han Yu (2025) further verified that under the "dual carbon" context, each one-level increase in ESG ratings reduces real estate firms' debt financing costs by an average of 0.38 percentage points.

The intensifying market competition is dismantling geographical barriers, creating a dynamic landscape where domestic markets become increasingly globalized while international markets grow more localized. Global industry leaders are accelerating expansion into emerging markets, while local developers diversify their overseas strategies. To thrive, enterprises must master both global resource integration and deep market penetration through localization. The competitive paradigm has shifted from resource acquisition to value creation, requiring companies to achieve standardized replication while adapting to local contexts. Zhang Shichao (2025) further highlights that ambiguous strategic positioning causes 60% of small and medium-sized real estate developers to lose market share in cross-border competition, while Li Xiao (2024) demonstrates that big data-driven precision marketing enables multinational developers to reduce customer acquisition costs by 23% compared to domestic counterparts.

The globalization of customer needs exhibits dual characteristics of homogenization and personalization. Green sustainability and smart convenience have become universal requirements, while digital transformation and green development have fundamentally transformed the value delivery logic in real estate marketing.

Concurrently, regional cultural differences drive demand personalization, with niche markets such as cross-border rentals and senior housing demonstrating rapid growth. This trend is propelling product and service development toward precision and customization. Huang Wei (2024) found that real estate developers employing digital marketing technologies reduced green residential inventory turnover cycles by 19% and increased customer willingness to pay for healthy living indicators by 12%. Li Xiao (2024) demonstrated that intelligent recommendation algorithms, through analyzing user behavior data, enhanced project matching accuracy by 28% and significantly shortened customer decision-making cycles.

While economic globalization brings opportunities, it also generates multifaceted operational pressures, primarily concentrated in five key areas, with the impact levels across different dimensions as follows:

Table 2.1- Core Business Pressure and Impact Pathways of Real Estate Enterprises

Challenge dimension	Key performance indicators
Tight financing	Domestic and international financing channels are tightening, costs are rising, and compliance requirements are escalating.
Intensifying competition	Domestic 'involution' erodes profits; localization challenges and competition with industry giants in global markets.
Rising compliance costs	ESG and cross-border regulations drive up costs; data security regulations create new pressures.
High conversion investment	Digital transformation, green transition, and asset-light transformation require sustained high investments with extended return cycles.
Faster spread of risk	Global economic and political shocks are impacting the industry at an accelerated pace and with more profound consequences.

Source: Compiled and constructed by the author

The most pressing challenge currently stems from intensified financing constraints, primarily driven by global liquidity fluctuations and tightened cross-border regulations. Domestically, China's "three red lines" policy and loan concentration limits continue to restrict traditional financing channels. At the international level,

monetary policy adjustments in major economies have elevated cross-border financing costs, subjecting real estate developers to "dual contraction pressures" both domestically and internationally. Compliance thresholds for cross-border financing have risen, requiring ESG disclosures, which further increase financing costs. Lin Yuxi (2023) emphasized that international policy disparities necessitate the establishment of dynamic risk management systems by real estate firms to address exchange rate volatility and geopolitical risks. Wang Jing (2024) found that sudden international capital outflows can deteriorate short-term debt repayment capacity indicators by 23%-31%. Liu Zhen (2024) proposed that dynamic hedging strategies could reduce foreign exchange risk exposure by 58%.

The current market competition has intensified dramatically, exhibiting dual characteristics of "localized integration and international differentiation." Domestic incremental markets continue to shrink, while the industry-wide profitability keeps declining. International giants leverage their capital advantages and operational capabilities to capture market share, with their overseas asset management efficiency far exceeding domestic averages. Overseas developers face dual pressures from inadequate localization capabilities and competition from global industry leaders, resulting in generally lower profitability of their overseas projects compared to domestic counterparts.

The rising compliance costs stem from disparities between international standards and cross-border policies. With continuous increases in ESG compliance investments, escalating expenses will further exacerbate industry segmentation. These policy differences complicate compliance processes, resulting in significantly higher costs for overseas projects compared to domestic ones, while data security compliance also introduces new pressures. Empirical research by Zhou Xiaokang et al. (2024) demonstrates that real estate developers utilizing NLP technology for ESG data processing achieved an average 1.2-grade improvement in international credit ratings.

The three key areas of digital transformation, green initiatives, and business model innovation have demonstrated significant outcomes of transformational

investments. While digital transformation requires sustained resource allocation and long-term returns, organizational adaptability and operational coordination remain major bottlenecks. Green building construction costs exceed traditional projects, imposing substantial financial pressure on small and medium-sized real estate developers. Transitioning from asset-intensive to asset-light operational models demands organizational restructuring and capability enhancement, while facing dual challenges of path dependence and talent shortages. Yu Guanjian (2025) found that digital cost control systems reduced cost deviation rates in overseas projects from ±7% to ±2%. Huang Hao (2024) proposed that digital cash flow forecasting systems can improve fund gap warning accuracy to 89%, yet such technologies remain underutilized within the industry with adoption rates below 30%.

The acceleration of risk transmission stems from the rapid spread of external shocks. Global economic fluctuations, geopolitical conflicts, and cross-border policy adjustments continuously intensify industry risks, significantly expanding the scope and impact of external shocks on markets. Higher levels of globalization lead to faster transmission speeds and deeper impacts of external shocks, necessitating real estate developers to shift their risk management strategies toward a "global risk early warning" model. Lin Yuxi (2023) noted that the combination of policy regulation and market volatility has reduced developers' profitability by 23%-31%, with credit risk and capital chain disruption risk showing significant positive correlations. Wang Jing (2024) further revealed enhanced interlinkages between financing risks and investment risks for developers in a globalized context, where foreign exchange volatility can cause cross-border financing costs to surge by 15%-20%.

Economic globalization has propelled the real estate industry into a critical phase of structural restructuring, value reconfiguration, and model transformation. Five core trends are expected to emerge, with their evolutionary paths gradually shifting from efficiency-driven to value-driven approaches, ultimately achieving an ecosystem-driven model. The specific evolutionary trajectories are as follows:

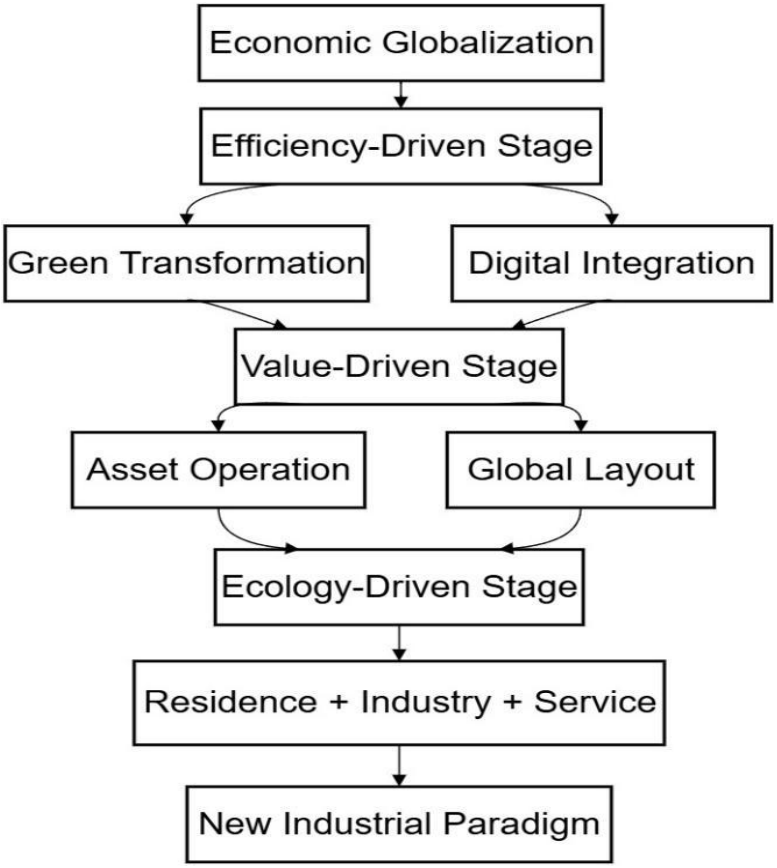

Figure 2.2- Evolutionary Logic of Real Estate Industry Development Trends

Source: Compiled and constructed by the author

Green and low-carbon development has become an irreversible trend, driving comprehensive lifecycle green transformation through carbon emission reduction and carbon neutrality initiatives. Driven by both policy constraints and market demands, green transition has emerged as a critical strategy for corporate survival and growth. The green building market now features significant premium pricing, establishing it as a core competitive advantage in the industry. Future green development will focus on three key areas: regional ecological integration, low-carbon retrofitting of existing buildings, and proactive empowerment for transformation, with the global low-carbon retrofitting market holding tremendous potential. Luo Xingyi (2024) demonstrated through Company A's case study that systematic ESG implementation can increase green bond issuance success rates by 21%.

Digital intelligence, serving as the core driving force, is reshaping production and service models through deep integration of technology with the entire value chain. Digital technologies such as artificial intelligence have become "core production factors" across industries. On the demand side, digital experiences are emerging as key factors influencing customer decisions, with smart home adoption rates continuing to rise. Enterprises are leveraging digital solutions to reduce costs, enhance efficiency, and significantly improve operational performance. Looking ahead, the industry will expand into full-process digital collaboration, intelligent service ecosystems, and digital transformation of industrial ecosystems, with end-to-end digital management becoming the mainstream approach. Gao Guangpeng (2025) demonstrated that integrating BIM with ERP systems reduced development cost control deviation rates from ±8% to ±3%, strengthening financial visualization management throughout project lifecycles.

Revitalizing existing assets has become a structural development trend, with the revitalization of existing assets emerging as a new growth engine. The urbanization levels of major global economies have reached relatively high levels, and domestic cities have ample housing stock, making the existing market the core battleground for real estate transactions. Policies support the revitalization of existing assets, with China introducing urban renewal and affordable rental housing policies, while the United States supports commercial real estate renovation through tax incentives. Research by relevant institutions indicates that the core of existing asset operations lies in refined asset appreciation. In the future, urban renewal, quality upgrading of rental markets, and securitization of existing assets will become three major development directions. Xu Guangcheng (2024) found that leading enterprises achieved a 27% increase in operating cash flow through existing asset securitization, but this requires supporting digital valuation systems to control asset discount risks.

Global layout optimization is a strategic trend shifting from "blind expansion" to "precision layout + localized operations." Intensified competition in domestic markets and emerging overseas opportunities are driving real estate companies to

pursue cross-border expansion. The balance between "global strategy + local execution" is key to successful globalization. Future regional layouts will focus on the Belt and Road Initiative, emerging markets in Southeast Asia, and core cities in Europe and America, achieved through localized adjustments of products and services as well as diversified cooperation models. Ouyang Lei (2025) proposed that flexible human resource management strategies can increase the market responsiveness of multinational teams by 32%, helping enterprises achieve localized operations.

Product service diversification has emerged as a pivotal trend in value repositioning, achieving deep integration across residential, industrial, and service sectors. Consumer demands have evolved from basic housing availability to prioritizing comfortable living experiences, with growing emphasis on supporting services. Diversified product offerings now serve as core differentiators in competition, as cross-sector solutions like industrial real estate and senior apartments rapidly gain momentum, becoming new growth engines for the industry. Future developments will focus on deepening cross-sector integration, optimizing value-added service portfolios, innovating product formats, and transitioning corporate profits from one-time sales to sustainable operations. The modular unit design methodology developed by Sheng Yuhong (2021) demonstrates that standardized green unit designs can enhance development efficiency by 30% while reducing building material carbon emissions by 15%.

Five pivotal trends are driving the evolution of marketing processes: shifting from product orientation to customer value-driven strategies, transitioning from offline dominance to integrated online-offline approaches, evolving from transaction-focused models to relationship-driven frameworks, and expanding from localized focus to global collaboration. Specific transformation directions and influencing factors are detailed in the table below:

Table 2.2- Impact of Industry Trends on Real Estate Marketing Processes

Industry Trends	process conversion	Key drivers
Green and low-carbon	Embedded Value Delivery ESG	ESG disclosure, certification, and immersive demonstration
Digitalize	Data-driven full-link reconstruction	Big data profiling, VR/AR experiences, AI support
Assets operation	Life Cycle Management	Business value transfer, integrated services
Globalization	Global coordination and local adaptation	Unified branding, localized channels, and customized strategies
Diversified services	Standardization→Customization	Customer segmentation, customized content, value delivery

Source: Compiled and constructed by the author

The green and low-carbon transition drives the integration of marketing processes into the 'ESG value communication' framework. Effective ESG messaging significantly enhances customer trust and purchase intent, with particularly notable results among cross-border consumer groups. To achieve this, marketing strategies should establish an ESG value discovery mechanism, demonstrate environmental benefits through scenario-based experiences and visualizations, and leverage third-party certifications to strengthen trust.

Digital intelligence is revolutionizing marketing processes through "data-driven end-to-end transformation," evolving from basic channel digitization to comprehensive data-powered collaboration models. Modern market analysis leverages big data to build customer profiles, while channel strategies optimize resource allocation through data insights. VR/AR technologies enhance immersive customer experiences, and AI-powered customer service systems integrated with CRM platforms enable rapid responses and personalized service delivery.

The operationalization of existing assets drives marketing processes to cover the entire lifecycle, establishing an integrated "transaction + operations" framework. In asset-centric markets, marketing must transcend sales-oriented thinking to create a closed-loop system encompassing "transaction-operation-value-added." During the

sales phase, operational value delivery is reinforced; the delivery phase integrates customer service; the operations phase enhances customer loyalty through community engagement and value-added services; while secondary marketing focuses on revitalizing existing assets.

Global strategy optimization requires marketing processes to strike a balance between "international coordination and localized adaptation." Successful cross-border marketing hinges on localized adjustments to content, channels, and services. At the global coordination level, this involves establishing a unified brand system, data platform, and resource repository. For localized adaptation, it entails crafting tailored marketing content, selecting localized channels, developing differentiated strategies, and providing cross-border asset management services.

The diversified development of products and services is driving a shift in marketing models from "standardized promotion" to "personalized customization." The inherent heterogeneity of real estate products necessitates marketing practices that establish a closed-loop operational capability centered on "segmentation-customization-adaptation." By implementing multi-dimensional customer segmentation, marketing content and service processes can be precisely tailored to different customer groups, thereby enhancing the efficiency of service value delivery and effectively meeting diverse customer needs.

2.2 China-Ukraine Real Estate Market Core Data Analysis

This section conducts a systematic and in-depth analysis of six core statistical tables of China's real estate market from 2020 to 2024, covering indicators across the entire industry chain such as development investment, construction supply, market sales, price levels, and residential supply-demand matching. All analyses are strictly based on the original data from the tables.

(1) Analysis of investment completion status by usage for real estate developers.

This table uses billions of yuan as the statistical unit, presenting the scale and structural changes of China's real estate development investment from 2020 to 2024, covering the total investment amount and four categories of investment classified by purpose. The complete original data is as follows:

Table 2.3- Completed Investment by Purpose for Real Estate Developers (billions yuan)

Metric		2024	2023	2022	2021	2020
Gross investment		10028.02	11214.23	12384.78	13763.33	13201.37
Include	House	7603.99	8496.12	9342.01	10328.15	9712.21
	Office building	415.99	457.11	503.48	568.48	617.99
	Commercial premises	694.40	806.72	972.22	1136.34	1195.24
	Other	1313.64	1454.28	1567.07	1730.36	1675.93

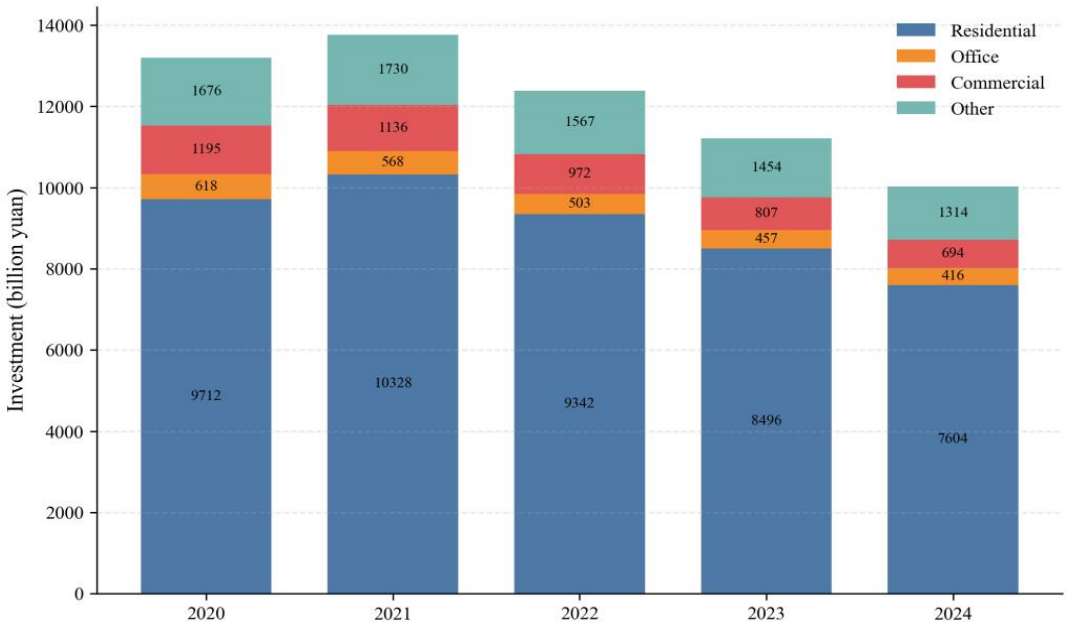

Figure 2.3- Completed Investment by Purpose for Real Estate Developers

Source: Compiled and constructed by the author

Trend analysis shows that the total investment of China real estate developers exhibited a "first rise followed by sustained decline" pattern during the observation period. The total investment climbed from 1,320.137 billion yuan in 2020 to a historical peak of 1,376.333 billion yuan in 2021, then entered a downward trend for three

consecutive years. In 2022, it dropped to 1,238.478 billion yuan, further declined to 1,121.423 billion yuan in 2023, and even fell to 1,002.802 billion yuan in 2024. Compared with the peak in 2021, the cumulative decline in 2024 reached 27.1%, with a year-on-year decrease of 10.58% in a single year, reflecting the continuous decline in investment willingness among real estate developers.

Structural analysis reveals that residential investment has consistently maintained an absolute dominance in total investment, with this advantage further solidified during market adjustments. The proportion of residential investment in total investment rose from 73.57% in 2020 to 75.83% in 2024. Trend analysis shows that after peaking at 1,032.815 billion yuan in 2021, residential investment declined to 760.399 billion yuan by 2024, representing a cumulative decrease of 26.38%. This decline rate was slightly lower than the overall investment growth rate, positioning residential investment as a core stabilizer driving development investment.

In contrast, non-residential real estate investment has shown a more pronounced and earlier downward trend. Since 2020, office building investment has continued to shrink, dropping from RMB 617.99 billion in the same year to RMB 415.99 billion in 2024, marking a cumulative decline of 32.69% over five years. Commercial property investment also saw a steady decline from its peak of RMB 1,195.24 billion in 2020 to RMB 694.40 billion in 2024, with a cumulative decrease of 41.90% - the largest among all sub-sectors - reflecting persistent weakness in demand for commercial and office real estate. Other types of real estate investments also exhibited a downward trajectory, falling from a peak of RMB 1,730.36 billion in 2021 to RMB 1,313.64 billion in 2024, representing a cumulative decline of 24.08%.

(2) Cost Analysis of Residential Floor Area for Real Estate Developers.

This table presents the changes in construction scale, completion efficiency, and costs of China's real estate development enterprises from 2020 to 2024, covering five core indicators such as construction scale, completion progress, and cost control. The complete original data of the table is as follows:

Table 2.4- Building Area and Cost of Housing for Real Estate Development

Enterprises

Metric	2024	2023	2022	2021	2020
Construction area (million square meters)	7332.47	8401.57	9045.00	9753.87	9267.59
Completed housing area (million square meters)	737.43	1019.99	853.58	1014.12	912.18
Building area completion rate (%)	10.1	12.1	9.4	10.4	9.8
Value of completed housing (billions yuan)	3275.93	4232.66	3494.02	3945.82	3449.38
Completed housing construction cost (yuan/square meter)	4442.35	4150	4093	3891	3781

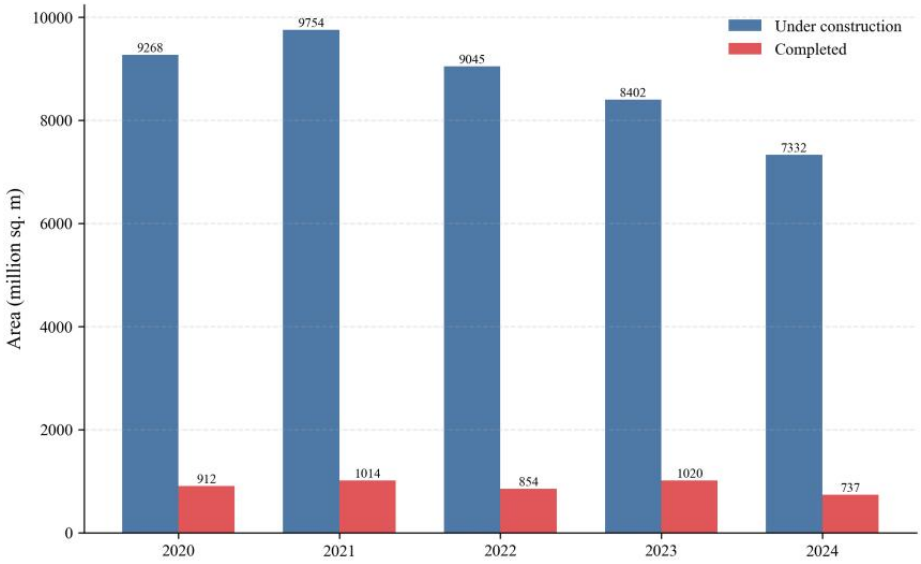

Figure 2.4- Building Area and Cost of Housing for Real Estate Development Enterprises

Source: Compiled and constructed by the author

In terms of construction scale, real estate developers 'total floor area reached its peak in 2021 before declining steadily. The construction area increased from 92.6759 million square meters in 2020 to a historic high of 97.5387 million square meters in 2021, followed by annual declines: dropping to 90.4500 million square meters in 2022,84.0157 million square meters in 2023, and further decreasing to 73.3247 million square meters in 2024. Compared to the 2021 peak, the cumulative decline in 2024

reached 24.82%, reflecting a continuous contraction in overall real estate supply and a significant reduction in developers' enthusiasm for initiating new projects.

The completed residential floor area exhibited fluctuating trends inconsistent with construction area changes. The completed area increased from 912.18 million square meters in 2020 to 1.01412 billion square meters in 2021, then declined to 853.58 million square meters in 2022. After rebounding to a temporary peak of 1.01999 billion square meters in 2023, it plummeted sharply to 737.43 million square meters in 2024, marking the lowest level during the observation period. Concurrently, the construction completion rate fluctuated between 9.4% and 12.1%, peaking at 12.1% in 2023 and dropping to 9.4% in 2022. The 2024 completion rate of 10.1% remained consistent with the five-year average. The 2023 recovery was primarily driven by China's "Presale Housing Delivery Guarantee" policy, while the 2024 sharp decline reflected ongoing contraction in existing construction inventory.

From a cost perspective, residential construction costs during the observation period exhibited a consistent annual upward trend, moving inversely to the reduction in investment scale and construction scale. Construction costs rose steadily from 3,781 yuan per square meter in 2020 to 3,891 yuan in 2021,4,093 yuan in 2022,4,150 yuan in 2023, and reached 4,442.35 yuan in 2024, representing a cumulative increase of 17.49% over five years. Correspondingly, completed residential property values fluctuated with construction area: 344.938 billion yuan in 2020, increased to 394.582 billion yuan in 2021, declined to 349.402 billion yuan in 2022, rebounded to 423.266 billion yuan in 2023, and fell again to 327.593 billion yuan in 2024. The sustained rise in construction costs further compressed profit margins for real estate developers, exacerbating operational pressures amid declining housing prices.

(3) Analysis of Sales Zones for Newly Built Commercial Residences by Purpose of Use.

This table uses million square meters as the statistical unit, presenting the sales scale and structural changes of China's newly built commercial residential market from

2020 to 2024, covering the total sales area and four subcategories classified by housing purposes. The complete original data of the table is as follows:

Table 2.5- Sales area of newly built commercial housing by use (million square meters)

Metric	2024	2023	2022	2021	2020
Newly-built commercial housing	973.85	1117.62	1221.54	1613.54	1588.19
Residential commercial housing	814.50	948.19	1033.06	1410.07	1399.27
Office building commercial property	24.03	27.15	29.86	30.88	30.57
Commercial premises	59.86	63.60	72.28	79.34	81.72
Other commercial housing	75.46	78.68	86.35	93.26	76.64

Figure 2.5- Sales area of newly built commercial housing by use

Source: Compiled and constructed by the author

From an overall trend perspective, the sales area of newly built commercial residential properties in China exhibited a pattern of "slight growth from 2020 to 2021, followed by a sustained sharp decline from 2021 to 2024." The total sales area reached a historical peak of 1.61354 billion square meters in 2021, then declined year by year:

it dropped to 1.22154 billion square meters in 2022,1.11762 billion square meters in 2023, and further decreased to 973.85 million square meters in 2024. Compared to the peak in 2021, the cumulative decline in 2024 reached 39.65%, with a year-on-year decrease of 12.86% for a single year, reflecting the persistent weakness in overall demand for commercial residential properties and indicating that the market has entered a deep adjustment cycle of demand contraction.

Structural analysis reveals that residential commercial real estate has consistently remained the dominant force in market sales, maintaining stable leadership throughout the observation period. In 2024, residential commercial real estate accounted for 83.64% of total sales area, remaining largely consistent with 88.10% in 2020 and 87.39% in 2021. Trend analysis shows that after peaking at 1.41007 billion square meters in 2021, residential sales area declined to 814.50 million square meters by 2024, representing a cumulative decrease of 42.24%—slightly exceeding the overall decline in total sales area.

The sales area of non-residential properties has shown a sustained downward trend, with the decline occurring earlier than that of residential real estate. Since 2021, office building sales area has continued to shrink, decreasing from a peak of 30.88 million square meters in 2021 to 24.03 million square meters in 2024, representing a cumulative decline of 22.18%. Commercial property sales area has been on a continuous decline since 2020, shrinking from 81.72 million square meters to 59.86 million square meters in 2024, with a cumulative drop of 26.75%. This reflects persistently weak demand for office and commercial real estate amid economic transformation and digital economy development. Sales area of other commercial residential properties also declined from a peak of 93.26 million square meters in 2021 to 75.46 million square meters in 2024, showing a cumulative decrease of 19.09%.

(4) Sales Analysis of Newly Built Commercial Residential Properties by Purpose of Use.

This table uses billions of yuan as the statistical unit, presenting the trend of transaction volume (transaction value) in China's new commercial residential housing

market from 2020 to 2024, with classification criteria consistent with the sales area statistical table. The complete original data is as follows:

Table 2.6 - Sales of newly built commercial housing by use (billions yuan)

Metric	2024	2023	2022	2021	2020
Newly-built commercial housing	9675.03	11666.09	12472.04	17015.87	16275.23
Residential commercial housing	8486.41	10301.32	10958.34	15263.67	14531.97
Office building	320.76	374.21	429.51	445.97	479.82
Commercial premises	572.82	662.83	729.81	870.22	889.69
Other commercial housing	295.05	327.73	354.39	436.01	373.74

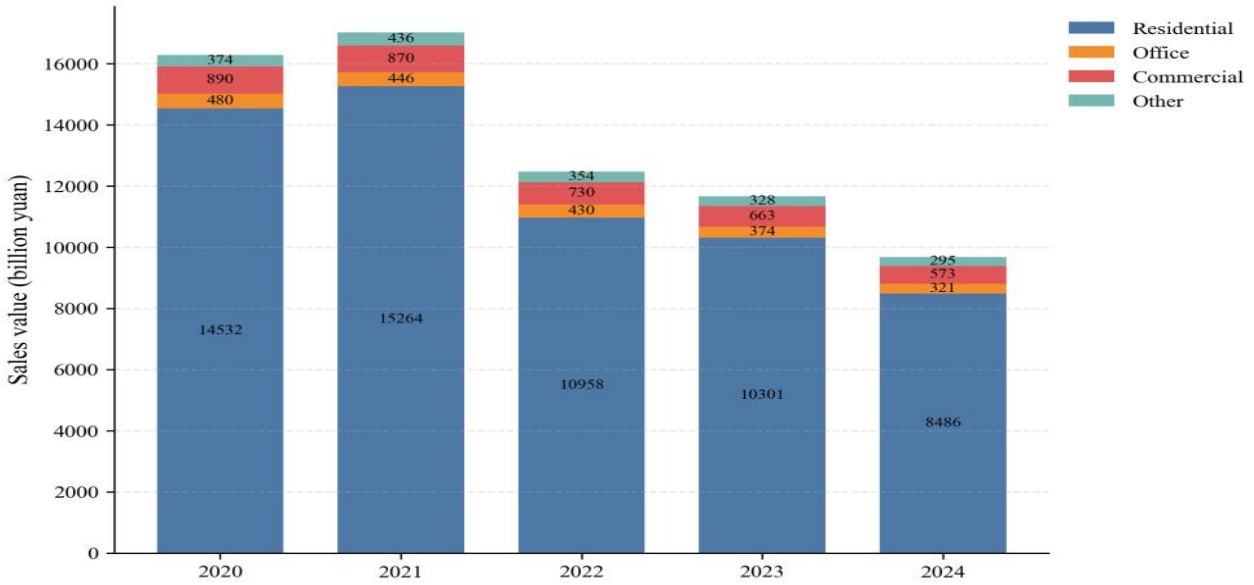

Figure 2.6- Sales of newly built commercial housing by use

Source: Compiled and constructed by the author

From an overall trend perspective, the sales volume and floor area of newly built commercial residential properties followed a consistent trajectory, experiencing a sharp decline after peaking in 2021. Total sales volume surged from 1.627523 trillion yuan in 2020 to a historic high of 1.701587 trillion yuan in 2021, then declined to 1.247204 trillion yuan in 2022, further reduced to 1.166609 trillion yuan in 2023, and plummeted to 967.503 billion yuan in 2024. Compared to the 2021 peak, the

cumulative decline reached 43.14% in 2024, exceeding the 39.65% decrease in floor area. This indicates that the market contraction stems not only from shrinking sales volume but is also closely linked to falling selling prices.

Structural analysis reveals that residential and commercial real estate contributed over 85% of total sales revenue, with their share further expanding during market adjustments. The proportion of residential sales in total sales rose from 89.29% in 2020 to 87.70% in 2021, and continued to climb to 87.71% by 2024. Trend analysis shows that after reaching a peak of 1.526367 trillion yuan in 2021, residential sales had declined to 848.641 billion yuan by 2024, representing a cumulative decrease of 44.40% - a rate nearly matching the overall sales decline.

The decline in non-residential property sales was more pronounced and emerged earlier. Office building sales have been on a continuous downward trend since 2020, dropping from 479.82 billion yuan in 2020 to 320.76 billion yuan in 2024, representing a cumulative decrease of 33.15%. Commercial property sales also declined steadily from a peak of 889.69 billion yuan in 2020 to 572.82 billion yuan in 2024, with a cumulative decline of 35.62% - a rate exceeding the reduction in sales area, reflecting synchronized declines in both pricing and transaction volumes for commercial properties. Other commercial residential properties saw sales plummet from a peak of 436.01 billion yuan in 2021 to 295.05 billion yuan in 2024, marking a cumulative decline of 32.33%.

(5) Average Price Analysis of Newly Built Commercial Residential Properties by Usage Classification.

This table presents the trend of price level changes for newly built commercial residential properties in China from 2020 to 2024, with the statistical unit being yuan per square meter, covering the overall average price of commercial residential properties and various subcategories. The complete original data is as follows:

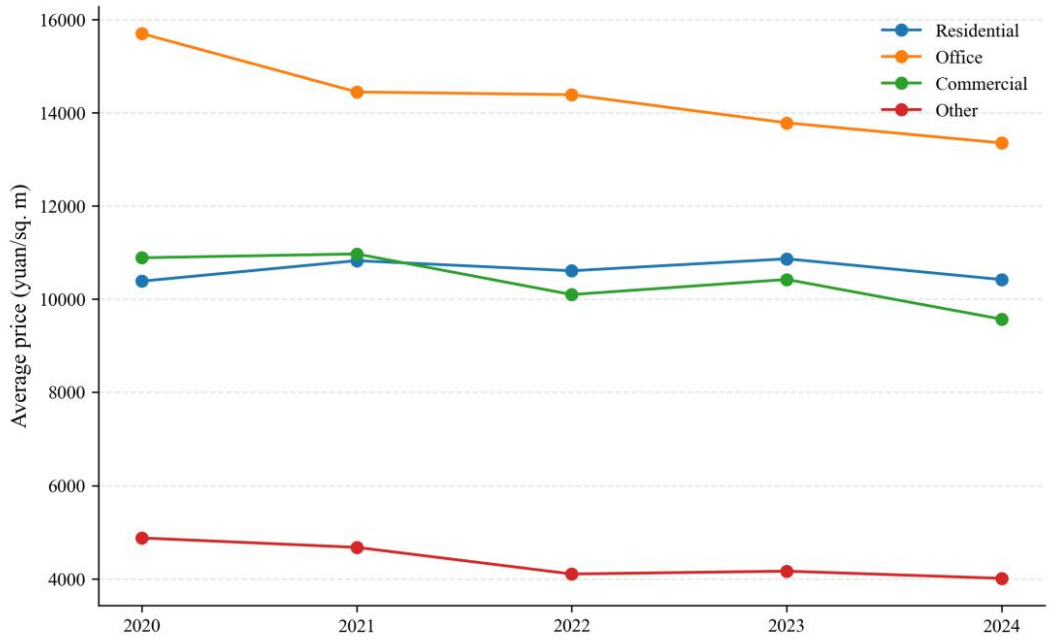

Figure 2.7- Average selling price of newly built commercial housing by use

Source: Compiled and constructed by the author

Table 2.7- Average selling price of newly built commercial housing by use (yuan per square meter)

Metric	2024	2023	2022	2021	2020
Newly-built commercial housing	9935	10438	10210	10546	10248
Residential commercial housing	10419	10864	10608	10825	10385
Office building commercial property	13350	13781	14385	14444	15697
Commercial premises	9569	10422	10097	10969	10887
Other commercial housing	4010	4165	4104	4675	4877

Source: Compiled and constructed by the author

From an overall trend perspective, the average price of newly built commercial residential properties in China showed a fluctuating downward trend during the observation period, peaking in 2021. The average price of commercial residential properties gradually increased from 10,248 yuan per square meter in 2020 to a high of 10,546 yuan in 2021, slightly declined to 10,210 yuan in 2022, and then slightly rebounded to 10,438 yuan in 2023, before falling to 9,935 yuan in 2024. The average

price in 2024 was 5.80% lower than the peak in 2021 and fell below the 10,000 yuan mark for the first time during the observation period, reflecting an overall downward trend in the national commercial residential property price level.

Structural analysis reveals significant price trends across different property types. Residential and commercial real estate prices exhibited a "rise-first, fall-later" pattern, peaking in 2023. Residential average prices gradually increased from 10,385 yuan per square meter in 2020 to 10,825 yuan in 2021,10,608 yuan in 2022, and temporarily surpassed the 10,864 yuan threshold in 2023 before declining to 10,419 yuan in 2024. Compared to the 2023 peak, average prices dropped by 4.10% - a decline notably lower than the overall market average - indicating stronger price resilience in residential properties compared to non-residential assets.

In contrast, the average prices of office and commercial real estate have shown a sustained downward trend with more pronounced declines. Since 2020, office building prices have continuously decreased, falling from a historical peak of 15,697 yuan per square meter to 13,350 yuan in 2024, representing a cumulative drop of 14.95% over five years. Commercial property prices peaked at 10,969 yuan per square meter in 2021 but have since retreated to 9,569 yuan by 2024, marking a cumulative decline of 12.76%. This reflects greater downward pressure on non-residential property prices due to weak market demand. Other commercial residential properties also exhibited a continuous downward trend, dropping from a peak of 4,877 yuan per square meter in 2020 to 4,010 yuan in 2024, with a cumulative decline of 17.78%—making it the category with the steepest price reduction among all real estate types.

(6) Analysis of Residential Completion and Sales Status by Real Estate Developers.

This table presents the supply-demand matching relationship of China's residential real estate market from 2020 to 2024, with statistical units measured in thousands of units, covering the number of completed residential units and the number of sold residential units. The complete original data is as follows:

Table 2.8- Residential Completion and Sales Status of Real Estate Developers

(thousands of units)

Metric	2024	2023	2022	2021	2020
Number of completed residential units	5363.11	6606.55	6277.09	6468.27	5976.60
Number of residential units sold	7000.14	8258.63	9062.68	12404.02	12309.38

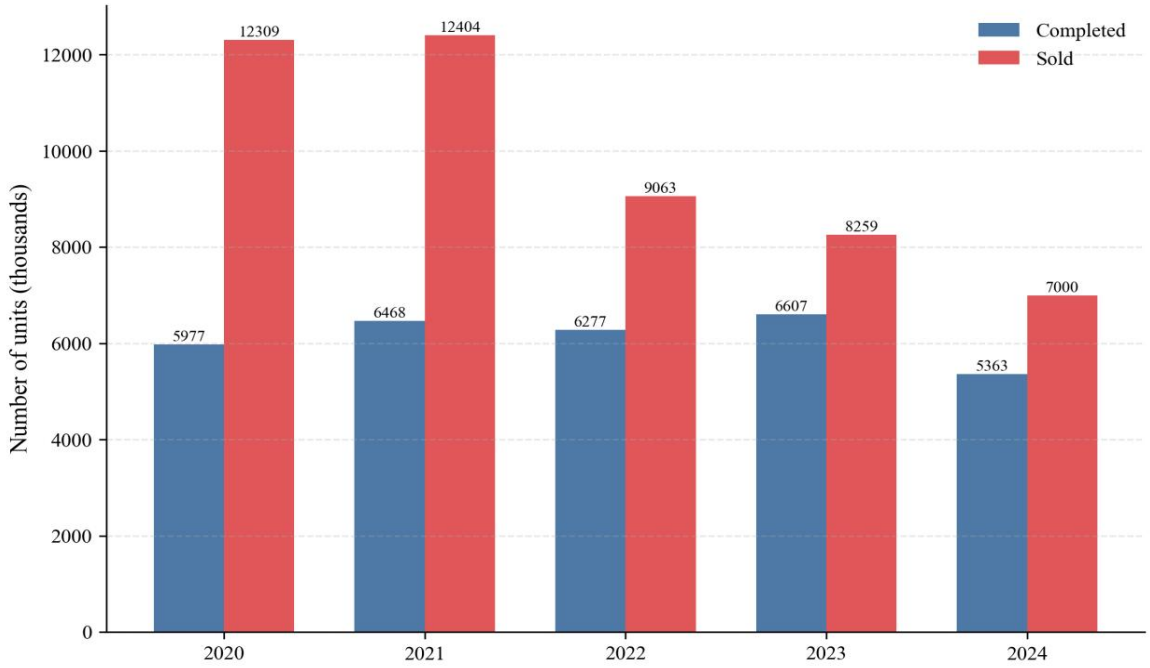

Figure 2.8- Residential Completion and Sales Status of Real Estate Developers

Source: Compiled and constructed by the author

From the supply side perspective, the number of completed residential units exhibited fluctuating trends during the observation period, peaking in 2023. The total number of completed units increased from 5.9766 million units in 2020 to 6.46827 million units in 2021, then slightly declined to 6.27709 million units in 2022. It rebounded to a temporary peak of 6.60655 million units in 2023 before plummeting sharply to 5.36311 million units in 2024, marking the lowest level observed during the period. Compared to the 2023 peak, the number of completed units in 2024 decreased by 18.82%, reflecting a significant contraction in residential market supply.

From the demand perspective, residential property sales experienced a sharp decline after peaking in 2021. Sales volume reached 12.30938 million units in 2020, slightly rebounded to a historical high of 12.40402 million units in 2021, but then

continued to decline: dropping to 9.06268 million units in 2022,8.25863 million units in 2023, and plummeting to 7.00014 million units in 2024. Compared to the 2021 peak, the cumulative decline in 2024 reached a staggering 43.57%, vividly reflecting the severe contraction in residential market demand.

From the perspective of supply-demand dynamics, residential sales volumes consistently exceeded completed construction volumes throughout the observation period. In 2020, sales reached 2.06 times the completed volume; this ratio decreased to 1.92 times in 2021, further declined to 1.44 times in 2022, continued to fall to 1.25 times in 2023, and stabilized at 1.31 times in 2024. Although the sales-to-completion ratio showed gradual decline, it remained above 1, indicating that the housing market is currently in a passive inventory reduction phase driven by shrinking new supply. While market inventory pressures have been partially alleviated, persistent demand contraction has emerged as the core constraint limiting market operations.

This section provides a systematic and in-depth analysis of five key statistical tables from Ukraine's real estate market between 2020 and 2024, covering core dimensions such as construction industry prosperity, output value scale, residential construction supply, and non-residential building structure. All analyses are strictly based on the original data from the tables.

(1) Analysis of Construction Industry Production Index by Type.

Table 2.9- Construction industry production index by type (%, compared to the previous year)

Metric		2020	2021	2022	2023	2024
Total construction cost		105.6	106.8	35.2	125	118.6
Building		93.7	110	38.2	113	124.4
Include	Residential building	83.5	119.2	40.2	98	110.8
	Non-residential building	100.3	105.1	37	122.9	131.6
Civil Engineering		115.6	104.6	33.1	134.8	114.5

This table presents the trend of construction industry prosperity in Ukraine from 2020 to 2024, measured by year-on-year growth rate (%) across the overall construction sector and four sub-sectors. The complete original data is as follows:

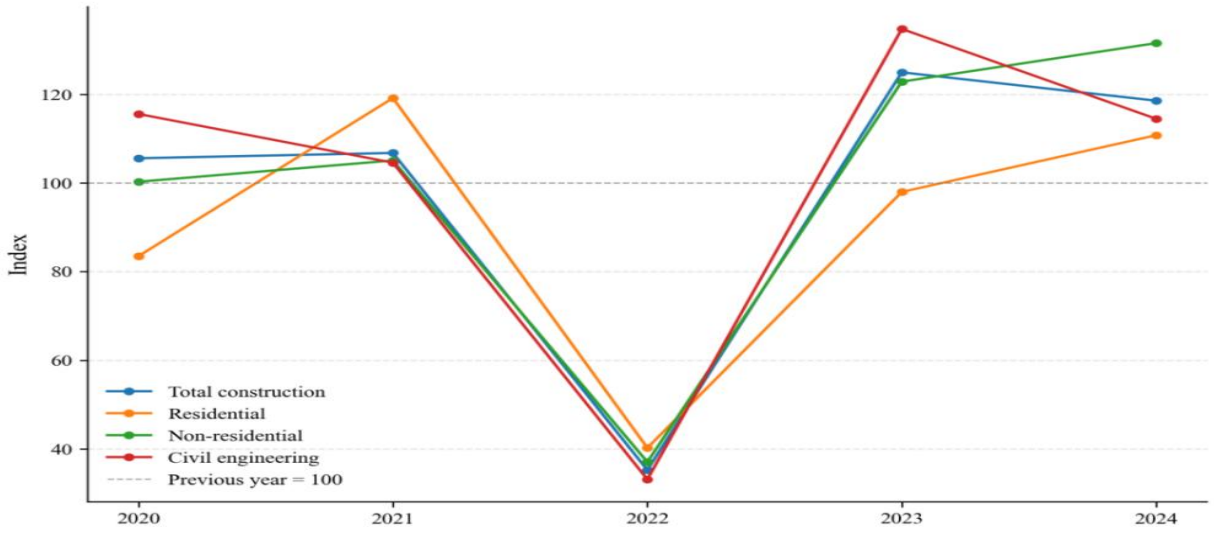

Figure 2.9- Construction industry production index by type

Source: Compiled and constructed by the author

From an overall perspective, Ukraine's construction industry production index exhibited a typical three-phase evolution pattern of "steady growth→precipitous decline→rapid recovery" during the observation period, with this process entirely driven by geopolitical shocks from the Russia-Ukraine conflict. In the pre-conflict phase (2020-2021), the total production index maintained stable growth, reaching 105.6% in 2020 and rising to 106.8% in 2021, with year-on-year increases of 5.6% and 6.8% respectively, indicating sustained industry prosperity. Following the outbreak of the conflict in 2022, the total production index plummeted to 35.2%, with the industry scale contracting by 64.8% year-on-year, plunging both the construction sector and real estate market into complete paralysis and severe contraction. During the post-conflict recovery phase (2023-2024), the industry entered a rapid rebound trajectory, with the total production index rebounding to 125.0% in 2023 (25% year-on-year increase) and further climbing to 118.6% in 2024 (18.6% year-on-year increase), achieving double-

digit growth for two consecutive years and demonstrating sustained improvement in industry prosperity.

Structural analysis reveals significant variations in production index fluctuations across subsectors. During the pre-conflict period (2020-2021), the residential construction sector demonstrated the most remarkable growth, with its production index reaching 119.2% in 2021 (a 19.2% year-on-year increase), serving as the primary growth driver for the construction industry. The non-residential construction index stood at 105.1% in 2021, maintaining steady growth of 5.1% year-on-year. In 2022, all subsectors experienced steep declines, with civil engineering showing the sharpest contraction at 33.1% (a 66.9% year-on-year contraction), while residential construction recorded the smallest drop at 40.2% (a 59.8% year-on-year contraction). These findings indicate that the residential sector maintained notable risk resilience even under conflict-induced shocks.

During the economic recovery cycle (2023-2024), the non-residential construction sector emerged as the primary driver of economic revival: The production index surged to 122.9% in 2023 (a 22.9% year-on-year increase) and further climbed to 131.6% in 2024 (31.6% growth), maintaining the highest growth rate among all sub-sectors. In contrast, the residential construction sector showed slower recovery, with an index of 98.0% in 2023 (down 2% year-on-year). Although rebounding to 110.8% in 2024 (up 10.8% year-on-year), the residential market still lagged behind the non-residential sector. The civil engineering sector demonstrated the strongest recovery momentum in 2023, with its index soaring to 134.8% (34.8% year-on-year growth). While slightly declining to 114.5% in 2024, this trend remained closely tied to post-war infrastructure reconstruction efforts.

(2) Analysis of Construction Industry Output Value by Type.

The table reflects the output value scale and structural changes in Ukraine's construction industry from 2020 to 2024, with statistical units measured in billions of UAH (Ukrainian Hryvnias). It covers total construction output value and two

subcategories: residential and non-residential buildings. The complete original data for the table is as follows:

Table 2.10- Construction industry output value by type (billion UAH)

Metric	2020	2021	2022	2023	2024
Building	80.63	102.89	50.17	65.51	87.61
House building	29.08	39.15	20.07	22.91	27.45
Non-residential building	51.54	63.75	30.10	42.60	60.16

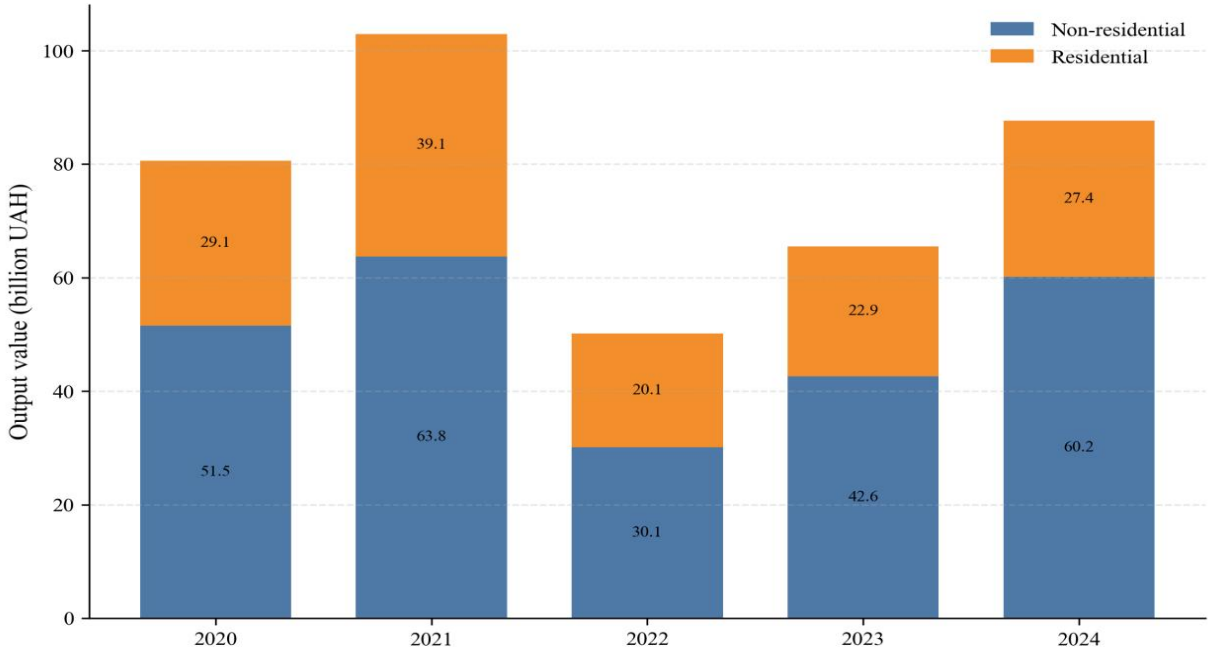

Figure 2.10- Construction industry output value by type

Source: Compiled and constructed by the author

From an overall perspective, the total output value and production index of Ukraine's construction industry exhibited complete alignment, demonstrating a three-phase transformation pattern: "steady growth→sharp decline→sustained recovery." The construction output value surged from 80.63 billion UAH in 2020 to a pre-conflict peak of 102.89 billion UAH in 2021, representing a year-on-year increase of 27.61%. In 2022, however, the output value plummeted to 50.17 billion UAH due to the conflict, marking a 51.24% year-on-year decline - nearly halving the previous level. During the recovery phase, the output value rebounded to 65.51 billion UAH in 2023 and further

reached 87.61 billion UAH in 2024, recovering 85.15% of the pre-conflict peak level. The industry scale has now approached pre-conflict standards.

Structural analysis reveals that non-residential construction has consistently dominated the total construction output value, with this advantage further solidified during the economic recovery period. In 2020, non-residential construction accounted for 63.92% of total construction output, which declined to 61.96% in 2021 but rebounded to 68.67% by 2024. The recovery pace of the non-residential construction sector significantly outpaced that of residential construction. Output value plummeted from a pre-conflict peak of 63.75 billion UAH in 2021 to 30.1 billion UAH in 2022, before rebounding to 60.16 billion UAH in 2024 - reaching 94.37% of pre-conflict levels and essentially returning to pre-pandemic scale.

In contrast, the residential construction sector has shown a slower recovery trajectory. Housing output value rose from 29.08 billion UAH in 2020 to a pre-conflict peak of 39.15 billion UAH in 2021, then plummeted to 20.07 billion UAH in 2022 before rebounding to 27.45 billion UAH in 2024 - reaching only 70.12% of pre-conflict levels, significantly lower than the recovery rate of non-residential construction. This trend aligns perfectly with changes in production indices, indicating that Ukraine's post-conflict real estate market recovery was primarily driven by non-residential construction, while residential market recovery lagged behind.

(3) Analysis of the number of residential buildings of various types under construction and completed.

This table presents the supply scale and structural changes in Ukraine's residential real estate market from 2020 to 2024, with statistical units being residential units. It covers both newly constructed and completed residential units, categorized into two subtypes: single-family homes and multi-unit residential buildings. The complete original data is as follows:

Table 2.11- Number of residential buildings started and completed by type (units)

Metric			2020	2021	2022	2023	2024
Total sets		Started	112109	170754	98386	66831	69294
		Completed	96504	151720	92593	89255	118452
Include	One family dwelling	Started	22526	26590	13318	20606	28354
		Completed	27624	28287	18281	23046	35658
	Residences with two or more households	Started	89583	144164	85068	46225	40940
		Completed	68880	123433	74312	66209	82794

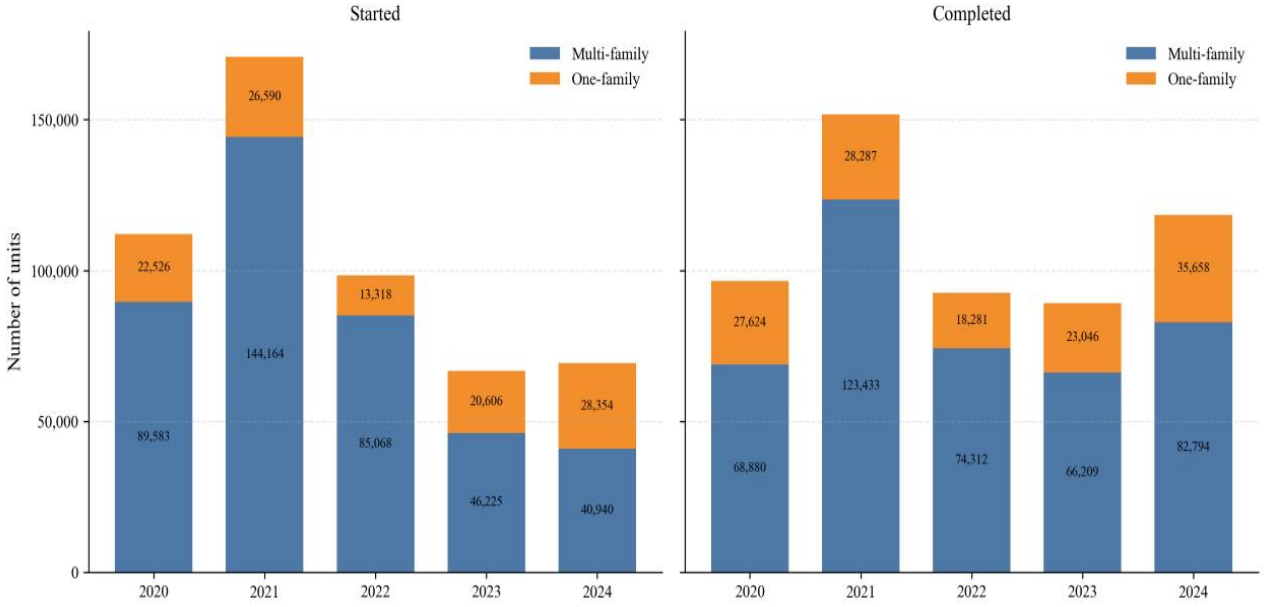

Figure 2.11- Number of residential buildings started and completed by type

Source: Compiled and constructed by the author

The overall trend in residential construction starts in Ukraine reveals a distinct pattern: a sharp surge from 2020 to 2021, followed by a continuous steep decline from 2021 to 2023, and a modest rebound in 2024. Construction starts increased from 112,109 units in 2020 to a pre-war peak of 170,754 units in 2021, marking a year-on-year growth of 52.31%. However, due to the conflict situation, starts plummeted to 98,386 units in 2022, a 42.38% year-on-year decrease, and further contracted to 66,831 units in 2023, reaching only 39.14% of the 2021 peak. Although starts rebounded

slightly to 69,294 units in 2024, they remain at historically low levels below 41% of pre-war highs, reflecting persistently weak enthusiasm among housing developers to initiate new projects amid ongoing conflict.

The overall trend in total housing completions reveals a pattern of "initial growth, decline in 2022, followed by sustained rebound." The number of completed residential units rose from 96,504 in 2020 to a pre-pandemic peak of 151,720 units in 2021, then plummeted to 92,593 units in 2022. This figure subsequently rebounded to 89,255 units in 2023 and reached 118,452 units in 2024. The 2024 completion count achieved the highest level since 2022, marking a 78.07% increase from the pre-pandemic peak and significantly exceeding the concurrent start-up rate. These data indicate that post-pandemic housing market supply was primarily driven by the resumption and delivery of existing projects rather than expansion of new construction initiatives.

Structural analysis reveals fundamental structural transformations in the residential market, with single-family homes gradually replacing multi-unit residential buildings as the core market driver. In 2024, new single-family home starts reached 28,354 units, surpassing both 2023 levels and the pre-pandemic peak of 26,590 units in 2021, demonstrating countercyclical growth. Completed units totaled 35,658, setting a new observation period record and marking a 54.72% year-on-year increase compared to 2023.

In contrast, multi-family residential buildings (residences accommodating two or more households) have shown a persistent and severe decline. The number of newly constructed residential units decreased from a pre-conflict peak of 144,164 units in 2021 to 40,940 units in 2024, representing a cumulative drop of 71.60% - less than 30% of the pre-conflict level. Although completed units rebounded to 82,794 units in 2024, this figure still only accounts for 67.08% of the pre-conflict peak of 123,433 units in 2021. This structural shift reflects how residential demand has significantly transitioned from centralized multi-family commercial housing to decentralized single-family homes under conflict impacts, marking a fundamental restructuring of the housing market's product structure.

(4) Analysis of Construction Area and Completion Area of Residential Buildings by Type.

This table, measured in square meters, illustrates the scale trends of residential floor area in Ukraine from 2020 to 2024. The data encompasses the total floor area of newly constructed and completed residential buildings along with their subcategories, with trends aligning with changes in residential unit numbers. The complete original data is presented below:

Table 2.12- Residential building started and completed areas by type (square meters)

Metric			2020	2021	2022	2023	2024
Total sets		Started	7514310	12714908	6668984	4205318	3903400
		Completed	8451221	11433790	7110224	7380752	9758881
Include	One family dwelling	Started	384138	356542	130065	164599	196556
		Completed	4271823	4351564	2783504	3482538	4974545
	Residences with two or more households	Started	7120737	12340397	6528517	4033659	3684172
		Completed	4172313	7051835	4320519	3886163	4782577
	Community housing	Started	9435	17969	10402	7060	22672
		Completed	7085	30391	6201	12051	1759

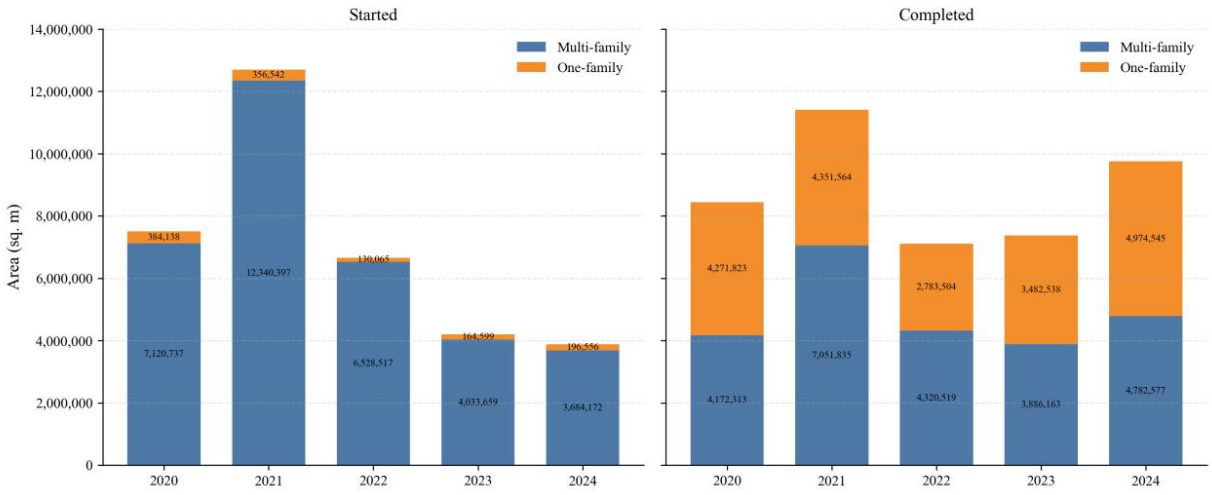

Figure 2.12- Residential building started and completed areas by type

Source: Compiled and constructed by the author

The overall trend in residential construction starts shows a pattern of "sharp increase from 2020-2021 followed by continuous decline from 2021-2024." The total construction area rose from 7,514,310 square meters in 2020 to a pre-pandemic peak of 12,714,908 square meters in 2021, representing a year-on-year growth of 69.21%. In 2022, it plummeted to 6,668,984 square meters, marking a 47.55% year-on-year decrease, and continued to decline to 4,205,318 square meters in 2023 and 3,903,400 square meters in 2024. The total construction area in 2024 stood at merely 30.70% of the 2021 peak, reflecting a severe contraction in new residential supply.

The total completed residential building area demonstrated a robust rebound following a decline in 2022. The data showed an increase from 8,451,221 square meters in 2020 to a pre-pandemic peak of 11,433,790 square meters in 2021, then decreased to 7,110,224 square meters in 2022. Subsequent annual increases reached 7,380,752 square meters in 2023 and 9,758,881 square meters in 2024. The completed area in 2024 grew by 32.22% year-on-year compared to 2023, recovering to 85.35% of pre-pandemic peak levels. This trend aligns perfectly with changes in completed unit quantities, further confirming that post-pandemic residential market supply is primarily driven by completed existing projects.

Structural analysis reveals that changes in area data further confirm the structural shift of the residential market toward single-family homes. In 2024, the completed area of single-family residences reached 4,974,545 square meters, accounting for 50.97% of total residential construction area. This marked the first time during the observation period that the proportion exceeded the 50% threshold, achieving counter-cyclical growth compared to the pre-pandemic peak of 4,351,564 square meters in 2021. By contrast, the completed area of multi-unit residences stood at 4,782,577 square meters, representing only 67.82% of the pre-pandemic peak of 7,051,835 square meters in 2021. The 2024 construction area of multi-unit residences was 3,684,172 square meters, merely 29.85% of the 2021 peak, reflecting a significant contraction in the market share of multi-unit housing.

Furthermore, the scale of community housing construction remains limited and exhibits significant fluctuations during the observation period. In 2024, the completed floor area of community housing stood at merely 1,759 square meters, a sharp decline from the peak level of 30,391 square meters recorded in 2021. This reflects the severe impact of the conflict on Ukraine's affordable housing supply, coupled with highly unstable construction volumes.

(5) Analysis of total floor area of different types of non-residential buildings.

This table, measured in square meters, presents the scale and structural trends of Ukraine's non-residential real estate market from 2020 to 2024. It covers the total gross floor area and completed area of non-residential buildings, categorized into seven subtypes. The complete original data is as follows:

Table 2.13- Total area of non-residential buildings by type (square meters)

Metric			2020	2021	2022	2023	2024
Overall floorage		Started	3791885	6241656	2538074	2866693	4414153
		Completed	3444193	4948874	2493070	2340350	2690954
Include	Hotels and Similar buildings	Started	333412	793509	197567	127176	359732
		Completed	123409	177158	143968	174557	242266
	Office buildings	Started	262137	437986	231316	171391	197366
		Completed	218636	344765	264142	137726	189453
	Wholesale and Retail trade buildings	Started	1165037	1702427	860963	732321	768545
		Completed	672192	1782723	511176	524793	500431
	Traffic and Communications buildings	Started	76088	158765	47996	69484	53543
		Completed	187304	279072	152489	65333	76120
	Industrial buildings and warehouses	Started	946290	1714314	843723	1183579	2318916
		Completed	701409	1120034	685847	850527	987485
	Public buildings	Started	284702	449180	111392	114846	156231
		Completed	321617	322073	344554	83297	103450
	Other non-residential buildings	Started	724219	985475	245117	467896	559820
		Completed	1219626	923049	390894	504117	591749

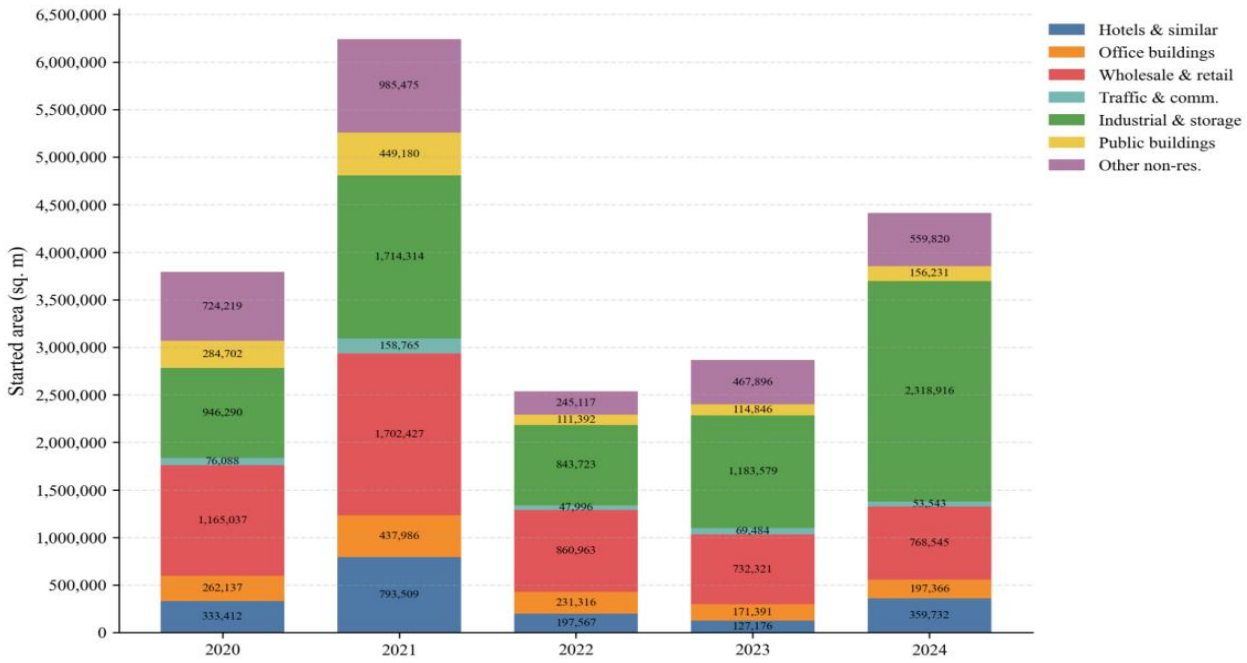

Figure 2.13- Total area of non-residential buildings by type

Source: Compiled and constructed by the author

From a macro perspective, the total construction area of non-residential buildings exhibited a distinct trajectory: "a sharp surge between 2020 - 2021, a precipitous decline in 2022, and sustained recovery from 2023-2024." The area increased from 3,791,885 square meters in 2020 to a pre-conflict peak of 6,241,656 square meters in 2021, marking a year-on-year growth of 64.61%. In 2022, it plummeted to 2,538,074 square meters, representing a 59.34% year-on-year decrease. However, it rebounded to 2,866,693 square meters in 2023 and further expanded to 4,414,153 square meters in 2024, recovering 70.72% of its pre-conflict peak level from 2021.

The total completed area of non-residential buildings has shown a fluctuating downward trend with relatively slow recovery. The data climbed from 3,444,193 square meters in 2020 to a peak of 4,948,874 square meters in 2021, then plummeted sharply to 2,493,070 square meters in 2022. In 2023, it slightly declined to 2,340,350 square meters before rebounding modestly to 2,690,954 square meters in 2024, recovering only to 54.37% of pre-conflict peak levels. This recovery rate significantly

lags behind the rebound in construction area, reflecting the extended project cycles of non-residential developments and their greater vulnerability to conflict impacts on completion schedules.

Structural analysis reveals that industrial buildings and warehousing facilities have emerged as key drivers in revitalizing Ukraine's non-residential market, achieving counter-cyclical growth that surpassed pre-war levels. In 2024, the total construction area of industrial buildings and warehouses reached 2,318,916 square meters, marking a 35.27% increase from the pre-war peak of 1,714,314 square meters in 2021. This accounted for 52.53% of the total non-residential construction area during the same period, representing the first time they accounted for over half of the market share. Completed construction areas also reached 987,485 square meters, representing an 11.85% decline from the 2021 peak, though the recovery rate significantly outperformed other non-residential property categories. These trends indicate sustained strong demand for industrial and logistics infrastructure in Ukraine amid wartime conditions, with industrial real estate emerging as the core growth engine for the property market.

In contrast, the recovery of commercial real estate and office properties has progressed relatively slowly, with overall scale remaining significantly below pre-war levels. In 2024, the construction area of office buildings reached 197,366 square meters, accounting for only 45.06% of the 2021 peak of 437,986 square meters. The construction area of wholesale and retail trade buildings stood at 768,545 square meters, representing merely 45.14% of the 2021 peak of 1,702,427 square meters. Although the construction area of hotels and similar buildings rebounded to 359,732 square meters in 2024, it still only reached 45.33% of the 2021 peak of 793,509 square meters. These figures reflect persistent weak demand for offline commercial, office, and tourism-related properties amid ongoing conflicts, indicating a severely lagging market recovery process.

Furthermore, the construction scale of public buildings and transportation/communication infrastructure remains limited, resulting in a sluggish

recovery pace. In 2024, the total floor area under construction for public buildings reached 156,231 square meters, accounting for only 34.78% of the 2021 peak level. Similarly, the floor area under construction for transportation and communication facilities stood at 53,543 square meters, representing merely 33.72% of the 2021 peak. These figures highlight that the development of public services and transportation infrastructure continues to be severely impacted by ongoing conflicts, with recovery progress remaining slow.

Through in-depth table-by-table analysis of core real estate market data from China and Uzbekistan, combined with original raw materials from comprehensive statistical datasets of both countries, this study conducts systematic comparative research across multiple dimensions including market volatility characteristics, market size and scale levels, structural evolution, supply-demand dynamics, and key driving factors.

(1) Comparative Analysis of Market Volatility Characteristics and Core Driving Factors.

The real estate markets of the two countries exhibit fundamental differences in volatility characteristics and core driving factors, which are reflected across all key data tables.

Since 2021, China's real estate market has exhibited a sustained, endogenous, and unidirectional downward trend, which is entirely driven by internal industry adjustments and the transformation of economic development logic. As shown by investment data, China's real estate development investment declined for three consecutive years from 2021 to 2024, with a cumulative decrease of 27.1%. Sales data indicate that both the floor area of commercial residential properties and transaction volume also showed a three-year consecutive decline, with cumulative decreases reaching 39.65% and 43.14%, respectively. During the observation period, none of the core indicators displayed significant reversal signals, highlighting the long-term and endogenous nature of market adjustments. The key drivers of this adjustment include: the implementation of deleveraging policies for real estate enterprises, a reversal in

residents' home purchase expectations, weakening population growth momentum, and the transition of the national economic structure from real estate dominance to high-quality development.

In contrast, the volatility of Ukraine's real estate market is entirely driven by external geopolitical shocks, exhibiting a classic nonlinear fluctuation pattern: "steady growth→cliff-like collapse→rapid recovery." The production index shows that Ukraine's construction sector maintained stable growth between 2020 and 2021. Following the outbreak of the conflict in 2022, the production index plummeted by 64.8% year-on-year, but subsequently rebounded to annual growth rates of 25% and 18.6% during 2023-2024. The output value table indicates that total construction output nearly halved in 2022 but recovered to 85.15% of pre-conflict levels by 2024. All core indicators in the Ukrainian market demonstrated significant inflection points in 2022, with fluctuations fully synchronized with the progression of the Russia-Ukraine conflict, exhibiting pronounced exogenous characteristics and event-driven patterns.

(2) Comparison of market size levels.

The real estate market sizes of the two countries exhibit significant disparities and operate at different scales, as evidenced across all key performance indicators.

In terms of investment scale and output value scale, China's real estate developers completed a total investment of 1,002.802 billion yuan in 2024, while the total output value of Ukraine's entire construction industry during the same period was only 87.61 UAH. Calculated at the 2024 exchange rate (approximately 1 UAH=0.20 yuan), Ukraine's construction industry output value was about 1.752 billion yuan, accounting for only 0.17% of China's real estate development investment scale, with a gap exceeding 570 times.

In terms of construction scale, China's real estate developers completed a residential area of 737.43 million square meters in 2024, while Ukraine's total completed residential area during the same period was only 9.76 million square meters, a difference of over 75 times. China's total floor area in 2024 reached 7.33247 billion square meters, more than 750 times the total area of residential and non-residential

construction starts in Ukraine during the same period (approximately 8.32 million square meters).

In terms of market transaction volume, China's total sales of newly built commercial residential properties reached 9.67503 trillion yuan in 2024, with a sales area of 973.85 million square meters. Although Ukraine's real estate market lacks nationally unified sales statistics for commercial residential properties, supply-side data shows that China's total residential unit sales in 2024 amounted to 70.0014 million units, equivalent to 59 times the total number of completed residential units in Ukraine during the same period (118,452 units).

The enormous differences in market size determine fundamental disparities between the two countries 'real estate markets in terms of development logic, policy regulation space, risk resistance capacity, and industrial structure. China's real estate market, as a super-large market crucial to national economic growth and financial stability, stands in stark contrast to Ukraine's real estate market, which is primarily driven by post-war reconstruction needs and basic housing demands as a smaller market.

(3) Comparison of market structure evolution trends.

During the observation period, the structural evolution of real estate markets in the two countries exhibited completely opposite trends, a characteristic reflected in structural data such as investment, construction, and supply.

From the perspective of residential and non-residential property structure, China's real estate market has consistently maintained an absolute dominance in residential properties, an advantage further consolidated during market adjustments. Investment data shows that residential investment accounted for 75.83% of China's total real estate investment in 2024, up from 73.57% in 2020. Sales data indicate that during the observation period, residential sales area accounted for over 83%, and total sales volume accounted for over 87%. In contrast, non-residential markets such as office and commercial properties continued to shrink, with both investment scale and

sales volume declining more sharply than residential properties, and their share in the overall market steadily decreasing.

Ukraine's real estate market exhibits a starkly contrasting structural evolution: non-residential properties are recovering at a significantly faster pace than residential properties, with industrial real estate emerging as the primary growth driver. Output value data reveals that Ukraine's non-residential construction output in 2024 rebounded to 94.37% of pre-war peak levels, while residential construction output only recovered to 70.12%. Non-residential floor area statistics indicate that industrial buildings and storage facilities accounted for over 52% of total non-residential construction starts that year, surpassing pre-war peak levels. In contrast, office and commercial building starts remained below 50% of pre-war benchmarks.

From the perspective of residential product structure, China's residential market is still dominated by multi-unit commercial housing, with no significant structural changes observed during the observation period. In contrast, Ukraine's residential market has undergone a fundamental structural transformation, with single-family homes replacing multi-unit residential buildings as the market core. Residential unit data shows that in 2024, the number of newly built single-family homes in Ukraine exceeded pre-war peaks, while the number of newly built multi-unit residences accounted for less than 30% of pre-war peaks. Area statistics indicate that in 2024, the completed area of single-family homes surpassed 50% for the first time, overtaking multi-unit residential buildings and becoming the dominant type in total residential construction.

(4) Comparative Analysis of Supply-Demand Logic and Operational Trends.

The real estate markets of the two countries share commonalities in supply-demand dynamics and operational trends, yet exhibit significant differences that are clearly reflected in core metrics such as construction starts, completed projects, and sales volumes.

The core commonality of the two major markets lies in both facing the challenge of shrinking new project numbers, with market participants 'willingness to initiate new

construction projects having significantly declined. Data shows that China's real estate market total floor area in 2024 dropped by 24.82% compared to the peak level in 2021, while Ukraine's new residential construction starts in 2024 were only 40.6% of the 2021 peak. Both markets' new construction scales in 2024 were far below their historical peaks in 2021, reflecting a cautious trend of investment reduction and expansion contraction among developers in both regions.

The fundamental difference lies in the supply-demand matching relationship and the logic of supply formation. China's real estate market exhibits the characteristics of "both supply and demand shrinking, with sales volume exceeding completed construction volume." As shown in the residential supply-demand table, throughout the observation period, China's residential sales volume consistently exceeded completed construction volume, indicating that the market is in a passive inventory reduction phase driven by shrinking new supply. Although both supply and demand have contracted, the core market contradiction has shifted from oversupply to insufficient effective demand.

Ukraine's real estate market exhibits a dual trend of "persistently low construction activity coupled with a robust rebound in completed projects," with the number of completed residential units far exceeding new starts. According to official statistics, Ukraine recorded 118,452 completed residential units in 2024, compared to merely 69,294 new starts, representing a completion rate 1.71 times higher than construction activity. Current market supply is entirely driven by the resumption of post-war existing projects rather than new development expansion. The fundamental challenges lie in supply chain disruptions caused by wartime conditions and unstable construction environments, rather than insufficient market demand.

(5) Comparison of Cost and Price Trends.

The real estate markets of the two countries exhibit markedly distinct characteristics in cost and price trends, a disparity that is fully reflected in the price and cost data tables.

China's real estate market is facing dual pressures of "continuously rising construction costs and persistently falling sales prices," which have continuously squeezed developers' profit margins. As shown in the construction cost table, the cumulative increase in China's residential construction completion costs from 2020 to 2024 reached 17.49%, demonstrating a year-on-year upward trend. Price data indicates that the average price of newly built commercial housing in 2024 dropped by 5.80% compared to the peak level in 2021, while the average prices of office and commercial real estate fell by 14.95% and 12.76% respectively during the same period. The inverse trend of rising costs and declining prices has led to a continuous shrinkage in developers' profit margins, further exacerbating industry operational pressures and debt risks.

In contrast, the Ukrainian real estate market has been more significantly affected by the conflict, with drastic fluctuations in production scale and operational scale, and the price system and cost structure are currently in the post-war reconstruction phase. The core changes in the Ukrainian market are reflected in production indices and output value indicators: the industry scale plummeted by over 60% in 2022, followed by a rapid recovery. Market costs and prices are more susceptible to external factors such as supply chain disruptions, building material shortages, exchange rate fluctuations, and inflation, exhibiting highly volatile trends. Unlike the China market, the Ukrainian market has not seen a reverse trend of continuous cost increases and price declines. The core factor affecting market operations is the geopolitical environment, rather than the dual pressure of costs and prices.

2.3 Evaluation of Marketing BPM Effectiveness in Real Estate Enterprises

The core of evaluating marketing process management effectiveness lies in conducting multidimensional analysis of "process input-output ratios and adaptability." Considering the six key characteristics of the real estate industry (high leverage, rapid turnover, policy sensitivity, regional disparities, product interconnectivity, and

prolonged customer decision cycles), the evaluation framework must balance quantitative metrics with qualitative analysis. It requires measuring actual process output efficiency through core economic indicators while assessing adaptability and sustainability by integrating internal and external environmental factors. To comprehensively reflect the integrated value of real estate marketing processes, the evaluation scope must encompass all stages including market analysis, sales strategy formulation, promotion execution, channel development, and after-sales services. This section establishes a dual evaluation system combining "core economic indicators" with "internal/external environmental factors," clarifying the selection logic, calculation methods, and impact mechanisms of each metric to provide actionable tools for subsequent performance diagnostics.

Core economic indicators serve as quantitative benchmarks for evaluating the effectiveness of marketing process management in real estate enterprises. The assessment framework focuses on four key dimensions: marketing investment efficiency, sales conversion rate, capital turnover efficiency, and customer value creation. By selecting six core metrics, a comprehensive evaluation system covering input-output ratios, capital turnover, and value generation is established. These interconnected indicators complement each other, enabling both individual assessments of specific marketing phases and holistic reflections of overall management capabilities. Lin Shan (2024) demonstrated from an industry-finance integration perspective that traditional financial metrics must be combined with operational indicators such as channel penetration rates and customer conversion cycles to accurately assess the true value creation capacity of marketing processes.

Table 2.14- Core Economic Indicator System for Real Estate Marketing Process

Metric	computational formula	Industry benchmark	Core Focus
Net profit ratio	(Net profit/Contract sales) × 100%	3.0%-5.0% (higher for advanced projects)	operating profitability
Marketing expense ratio	(Marketing cost/contract sales) × 100%	Basic components: 3.0%-5.0% Increase range: 5.0%-7.0% Premium: 6.0%-8.0%	Cost Efficiency and Control
Inventory cycle	Current inventory / Average monthly sales over the past 6 months	Tier 1/2 cities: 18-30 months Grade 3/4 cities:>30 months	inventory turnover ratio
Cash flow break even	Number of months from financing to positive net cash flow	Top-tier companies: 20-28 months Small and medium-sized enterprises: 30-40 months	Balancing safety and efficiency
CAC	Marketing cost per new customer acquisition	2,500–3,500 yen per customer	certainty of measurement
CLV/CAC ratio	Customer Lifetime Value / Customer Acquisition Cost	Health: ≥3.0 Best performer: ≥3.5	long term customer value

Sales profit margin is a core indicator for measuring the ultimate profitability of marketing processes. Its fluctuations directly reflect the collaborative efficiency throughout the entire process from market positioning to sales collection. Between 2023 and 2024, the average sales profit margin of China's listed real estate enterprises has dropped to the range of 3.2%-4.5%. Project positioning is a key factor influencing this metric. High-end projects with stronger product and brand premium capabilities typically exhibit significantly higher sales profit margins compared to basic demand-oriented projects.

The marketing expense ratio serves as a key metric for evaluating the efficiency of marketing resource allocation and process cost control, with its core objective being to achieve optimal alignment between input and output. Although real estate developers continue to reduce sales expense ratios, significant variations persist across project segments: basic residential units typically maintain ratios between 3.0% and

5.0%, upgraded residences range from 5.0% to 7.0%, while high-end residential properties and commercial real estate may reach 6.0% to 8.0% due to increased investments in brand building and experiential marketing resources. Research by Zhang Yingying (2025) indicates that industry leaders can control marketing expenses at 3.5%-4.2% through dynamic cost monitoring. Studies by Lin Nian (2022) and Wang Mengyao (2021) confirm that comprehensive budget management and integrated property-financial systems optimize resource allocation and reduce marketing expense variances. Industry frontrunners like Poly Development repeatedly emphasize in annual reports that digital precision positioning and process optimization not only enable effective marketing expenditure control but also continuously enhance marketing efficiency.

The inventory digestion cycle directly measures the efficiency of marketing processes in clearing inventory and recovering funds, which is crucial for corporate cash flow security. Public data shows that between 2023 and 2024, China's commercial housing inventory digestion cycle exhibited a fluctuating upward trend, with growing disparities among cities. By early 2024, the average digestion cycle in key cities had exceeded 27 months, while some third-and fourth-tier cities faced greater pressure due to weak demand and inventory accumulation. Lin Hua (2023) pointed out that during market downturns, customer tiered management needs to be strengthened, as the conversion rate of traditional extensive customer acquisition models has significantly declined. Key controllable variables affecting this cycle include channel strategies, pricing models, and promotional rhythms within marketing processes.

The cash flow turnover cycle aligns closely with the high-turnover operational characteristics of the real estate industry. This metric measures the time required from capital investment to full recovery. Zhang Tianfu (2024) noted that project debt structures influence the efficiency of marketing fund allocation. Studies by Wang Chao (2020) and Zheng Jian (2025) demonstrated that leading real estate developers can shorten payment cycles and reduce financing costs by optimizing marketing collection processes. Industry practices show that top-tier developers typically achieve 8-10

months shorter cash flow turnover cycles compared to small enterprises through systematic marketing processes and robust channel management, directly reflecting their efficiency advantages in customer acquisition and sales conversion.

CAC serves as a key metric for evaluating customer acquisition accuracy and cost-effectiveness. With the rapid advancement of digital marketing technologies, precision targeting enabled by big data and artificial intelligence has become a primary strategy for reducing CAC. Research by Li Jing (2020) and Li Xiao (2024) demonstrates that big data and intelligent recommendation systems significantly enhance customer segmentation accuracy and property matching efficiency. Industry data reveals that leading real estate developers have successfully maintained competitive CAC levels by establishing closed-loop digital marketing ecosystems—including AI-powered customer acquisition, VR property tours, and WeChat private domain operations.

The Customer Lifetime Value (CLV) to CAC reflects an enterprise's ability to create long-term customer value through marketing processes. Industry analysis indicates that domestic real estate developers still have room for improvement in focusing on and exploring this metric compared to mature markets. Leading industry players can effectively enhance customer lifecycle value by establishing high-quality property service systems and existing customer incentive programs, thereby achieving superior CLV/CAC performance. This marks a strategic shift from transaction-oriented approaches to customer relationship-centric strategies.

In summary, quantitative analysis of core economic indicators provides direct diagnostic insights for evaluating the health status of marketing processes. Abnormally high marketing expense ratios and excessively long sales cycles typically indicate specific management deficiencies within the process, such as inefficient channel utilization or inappropriate promotional strategies. Therefore, implementing differentiated benchmarking and management practices based on project positioning and market tiers remains crucial for enhancing overall marketing process efficiency.

The effectiveness of marketing process management in real estate enterprises depends not only on internal resource allocation and process design, but is also profoundly influenced by external and internal environmental factors. These factors exhibit indirect, complex, and dynamic characteristics, with their mechanisms permeating every stage of the marketing process. Based on industry-specific attributes, these factors can be categorized into external and internal environmental elements. By analyzing their impact pathways and operational mechanisms, we can further refine the evaluation system.

External environmental factors constitute objective constraints in marketing process management for real estate enterprises, where the synergistic effects of three core elements determine the external adaptability of marketing processes. Policy regulation influences various stages of marketing processes through "mandatory guidance" and "directional control." Studies by Zheng Shigang et al. (2023) and Li Lin (2022) indicate that housing price regulation policies require adjustments to pricing strategies and outreach methods within marketing processes, necessitating the establishment of a "policy radar" mechanism for dynamic adaptation. The "Three Red Lines" policy shifts marketing objectives from "scale expansion" to "cash flow normalization," while price caps compensate for competitiveness gaps through product/service optimization, thereby driving process refinement. The "city-specific strategies" model emphasizes regional differentiation: processes in first-and second-tier cities focus on upgrading housing needs, whereas third-and fourth-tier cities prioritize meeting basic housing demands and inventory reduction, resulting in significant differences in process design and resource allocation.

Market fluctuations influence process positioning and conversion through "supply-demand adjustments" and "changes in consumer behavior." Under current market conditions, the reversal of supply-demand dynamics has shifted process positioning from "product promotion" to "demand discovery." As consumer decision-making cycles lengthen, this necessitates targeted adjustments in channel strategies and service approaches.

Technological innovation reshapes process design through "process empowerment" and "model innovation." Guo Yongqing (2024) and Gao Wenxin (2024) pointed out that technology application must be accompanied by comprehensive risk prevention measures. Some small and medium-sized real estate developers experience process disconnection due to superficial technology adoption.

Internal environmental factors provide foundational support for marketing process management, with the synergistic interaction of three core elements collectively forming an internal support system. Organizational structure influences process coordination through "authority responsibility allocation" and "collaborative efficiency." Liu Qiong (2020) and Wang Fangxian (2022) highlighted that departmental parochialism leads to data silos, while establishing an iron triangle mechanism integrating marketing, design, and cost management can enhance collaborative efficiency. The "light front-end, robust middle-end, and stable back-end" architecture improves marketing process responsiveness and collaboration efficiency, whereas traditional hierarchical structures often result in redundant processes and delayed decision-making. Ambiguous authority responsibility delineation and inadequate communication mechanisms may trigger departmental buck-passing and process disconnection, ultimately compromising conversion efficiency.

Enterprise resources influence process inputs and outputs through "resource allocation" and "support capabilities". A study by He Xianzhen (2019) revealed that financing constraints faced by small and medium-sized real estate developers limit their technological investment capacity in marketing BPM.

Marketing team elements influence process execution quality through "professional competence" and "implementation efficiency." Core competencies include customer insight, communication and negotiation skills, and digital operational capabilities. Li Xueru (2025) noted that transitioning from financial accounting to management accounting can enhance team execution efficiency. Liu Lei (2021) demonstrated that insufficient technological investment in small and medium-sized real estate developers limits the improvement of digital operational capabilities.

Procrastination behaviors and weak collaboration awareness may prolong process cycles and miss marketing opportunities, while inadequate learning capacity can lead to rigid process patterns.

The influence mechanisms of internal and external environmental factors are interwoven. The external environment determines the direction of process adaptation, while the internal environment dictates execution capability. The dynamic alignment between these two factors serves as the core guarantee for the effectiveness of process management.

Figure 2.14- Environmental Factors Affecting the Management Effectiveness

Source: Compiled and constructed by the author

By integrating core economic indicators with an evaluation system that comprehensively considers internal and external environmental factors, and through case studies of real estate developers of varying scales from authoritative industry reports, we identify widespread deficiencies in marketing process management among current real estate enterprises, particularly prominent among small and medium-sized developers. These interconnected shortcomings create a vicious cycle characterized by "strategic misalignment, operational inefficiency, process incoordination, and suboptimal performance," ultimately leading to underwhelming core economic indicators and inadequate adaptability to environmental changes. This section will

analyze the manifestations and impacts from two dimensions: "weak market adaptability" and "insufficient technological support along with other core process challenges."

Market adaptability serves as the core qualitative indicator for evaluating the efficiency of marketing process management in real estate enterprises. Most developers exhibit weak market adaptability, with small and medium-sized enterprises facing more severe challenges due to resource and capability limitations. This issue permeates all process stages and can be summarized into four key dimensions.

Table 2.15 - Core manifestations and impacts of weak market adaptability

Problem types	Cardinal symptom	Influence	Typical indicator
Delayed demand insight	Empirical decision-making, static/surface study	Product market misalignment and incorrect positioning	The research data do not reflect the true market conditions.
Rigid strategic adjustment	Stiff pricing, slow product updates, and prolonged decision-making cycles	Missed the market window period, delayed response	The adjustment cycle lags far behind market changes.
Poor channel integration	Excessive reliance on offline channels, disconnection between online and offline operations, and insufficient target positioning	Low conversion rate and high customer churn rate	Low online conversion rate and inefficient channel return on investment
Severe content homogenization	Focus on common features (location, price) but lack unique brand positioning	Insufficient brand differentiation and appeal	Difficult to distinguish from competing products with no significant characteristics

The lag in demand insights has led to misaligned market positioning. Qiao Zongyao (2025) noted that urban populations 'preference for ecological value requires marketing processes to incorporate more value transmission nodes, yet some real estate developers failed to adapt promptly due to delayed market understanding. A staggering 45% of small and medium-sized developers still rely on "executive experience + competitor imitation" to assess market needs. Traditional research methods are time-consuming and labor-intensive, making it difficult to capture market dynamics in real

time. Many companies focus solely on floor plan layouts and budget constraints while overlooking consumers' deeper needs. Their upgraded residential projects, lacking value-added elements like community amenities and property management services, face mounting sales pressure. Most small and medium-sized developers lack dynamic demand tracking mechanisms, resulting in prolonged misalignment between market positioning and actual consumer needs.

Rigid policy adjustments have resulted in delayed responses. Research by Xu Wei (2025) indicates that extending consumer decision chains requires refined process redesign, yet some enterprises fail to adapt due to strategic rigidity. Certain companies exhibit inflexible pricing strategies, leading to inventory overstock during market downturns and missed premiumization opportunities during economic recovery. Their product strategies lag behind evolving consumer demands, failing to capitalize on market trends like green buildings and smart home technologies. The root cause lies in redundant decision-making processes, where marketing decisions require multi-level approvals, causing prolonged cycles and missed market opportunities.

Ineffective channel integration results in low customer acquisition efficiency. Small and medium-sized real estate developers generally over-rely on offline channels, with imbalanced marketing budget allocation and low online customer acquisition rates. The disconnect between online and offline channels, coupled with the lack of effective conversion mechanisms, leads to persistently high customer churn rates. Channel selection lacks specificity—high-end projects blindly invest in mass-market channels, while affordable housing projects fail to establish cost-effective offline intermediary networks, limiting customer coverage. Most companies lack effective channel evaluation mechanisms, unable to eliminate inefficient channels, resulting in severe resource wastage.

Excessive content homogenization has significantly diminished appeal. Most real estate developers face issues with repetitive marketing materials, lacking innovation in promotional copy and videos, while event planning remains stuck in traditional formats. Small and medium-sized developers often lack distinctive brand

communication strategies, making it difficult to effectively attract customers through brand building. In this context, content differentiation has become a critical factor in boosting customer conversion rates.

The four manifestations of weak adaptability in the real estate market are interrelated, with small and medium-sized developers facing more prominent challenges due to insufficient resources and capabilities. Although leading developers have demonstrated relatively better performance, they still exhibit shortcomings such as inadequate regional adaptability and lack of content innovation.

Furthermore, the lack of technical support and challenges in other core processes further constrain the effectiveness of marketing process management in real estate companies, resulting in multidimensional process management deficiencies due to insufficient market adaptability.

Table 2.16- Core challenges constraining marketing process efficiency

Problem Dimension	Core Manifestation
Insufficient technical support	Prominent data silos, hindering digital transformation
Poor process coordination	Obstructed cross-departmental collaboration, limiting operational efficiency
Inadequate process standardization	Processes not sufficiently standardized, restricting efficiency improvement
Poor supplier management	Lack of refined management and dynamic budgeting, leading to resource waste

Insufficient technical support, inefficient process coordination, and poor supplier management remain core challenges constraining marketing process efficiency. Among these, inadequate technical infrastructure severely hinders digital transformation efforts - despite digitalization and artificial intelligence having become fundamental technological pillars in modern marketing management, only a minority of real estate developers have achieved comprehensive data integration. Deng Xiaoxia (2021) proposed establishing a marketing data middleware platform to resolve data silo issues and circumvent limitations of traditional BI systems. Ineffective process

coordination impedes cross-departmental collaboration critical to marketing operations efficiency, while poor supplier management leads to resource wastage. Research by Zhang Yingying (2025) and Lin Nian (2022) demonstrates that refined management practices and dynamic budgeting mechanisms can significantly enhance marketing resource utilization and control cost deviations. These challenges stem from four key dimensions: technological empowerment, interdepartmental collaboration, process standardization, and supplier management. Small and medium-sized real estate developers face prominent issues including limited resources, insufficient technical support, and coordination bottlenecks, whereas industry leaders primarily encounter challenges in process standardization and refined supplier management systems.

2.4 Analysis on Implementation and Innovation of Marketing BPM in Real Estate Enterprises

The structural framework for real estate marketing process management and innovation extends far beyond a simple accumulation of steps, constituting a multidimensional organic system centered on value creation. This framework comprises four core modules that form a closed-loop interaction through three mechanisms: goal synergy, functional complementarity, and dynamic adaptation.

Table 2.17- Four Core Dimensions of Real Estate Marketing Process Management and Innovation

Dimension	Core content
Value creation	Through end-to-end value mining, shaping, delivery, and realization, we unify customer and enterprise value.
Cooperate with	Address internal/external coordination issues through an accountability system and data collaboration processes to ensure process efficiency.
Technology Empowerment	Enhance efficiency and innovation through three-tier digital support: tools, data, and scenario applications.
Risk Management	Through end-to-end management of compliance, market, and operational risks, ensure the stable implementation of innovation.

As a core structural element, the value creation dimension focuses on "integrating customer value with corporate value," encompassing four key sub-modules: value discovery, value creation, value delivery, and value monetization. In marketing management theory, value creation serves as the core of marketing processes, requiring seamless integration across the entire chain from "demand identification to value proposition formulation and value delivery." This dimension directly corresponds to the fundamental principles of real estate marketing processes—"demand discovery, value creation, implementation, and post-implementation optimization." Its primary function is to transform customers' deep-seated needs into tangible product and service value while achieving corporate sales targets and brand equity accumulation. Specifically, value discovery relies on market analysis and customer profiling technologies to accurately identify value propositions for different customer segments. Research by Chen Huizheng et al. (2025) demonstrates that data platforms and scenario innovation can significantly enhance precision in value discovery and creation processes.

As a pivotal pillar in the digital era's architecture, the technology empowerment dimension operates through a core framework of "technology tools - data infrastructure - application scenarios". The digital middleware resolves system fragmentation issues while serving as the foundational platform for technological empowerment. AI technologies optimize decision-making processes and accelerate market responsiveness. The technology tool layer incorporates solutions like CRM systems and VR/AR tools, with online property sales platforms integrating VR property tours significantly boosting customer conversion rates. The application scenario layer enhances operational efficiency through seamless integration of technology and business processes.

This risk management framework is designed for the highly sensitive policy environment and high-value attributes of the real estate industry, establishing a three-tiered architecture that integrates "compliance management - market risk - operational risk." Risk control must permeate all process stages, ensuring implementation stability

through a three-phase strategy of "pre-event prevention - event control - post-event traceability." The framework aligns with the early assertion that "risk management is the core objective of business process management in real estate," providing critical safeguards for structural stability.

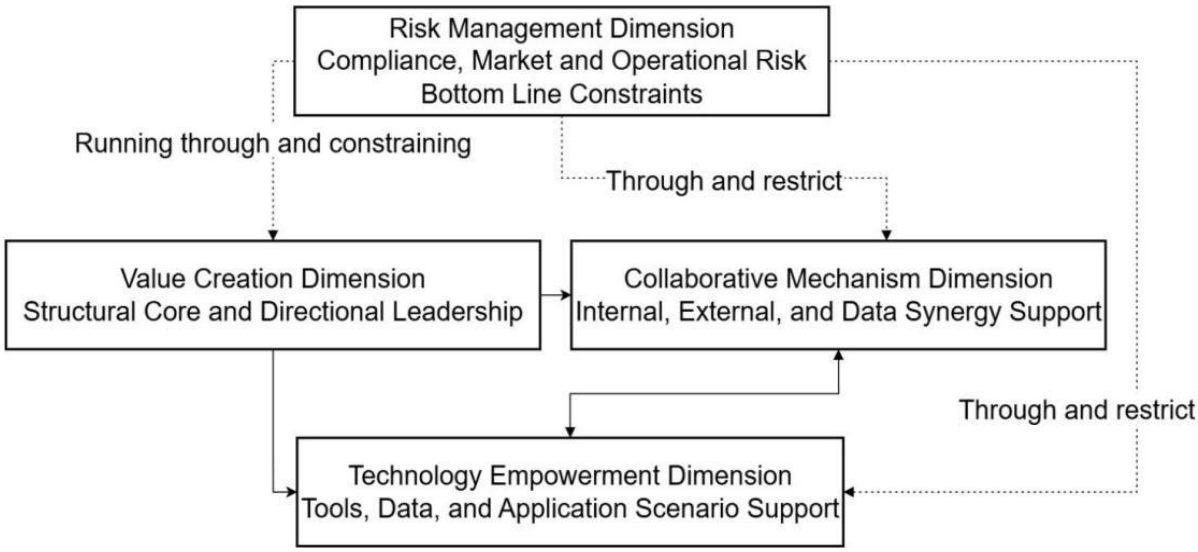

Figure 2.15- Four Core Dimensions of Real Estate Marketing Process and Their Correlation Logic

Source: Compiled and constructed by the author

These four core dimensions are not isolated but form an interconnected framework: value creation serves as the central focus, supported by collaborative mechanisms and technology empowerment, with risk management acting as fundamental constraints. The value creation dimension dictates organizational structure positioning, where both collaborative mechanisms and technology empowerment designs revolve around value creation objectives. For instance, collaborative mechanisms primarily address "process bottlenecks during value transfer," while technology empowerment focuses on enhancing "efficiency in value discovery and monetization." These dimensions complement each other: collaborative mechanisms provide application scenarios for technology empowerment, which in turn ensures operational efficiency. Taking RPA tools as an example, RPA technology simplifies cross-departmental approval processes, boosting collaboration efficiency

while creating practical implementation scenarios for technology empowerment. The risk management dimension permeates all three dimensions, ensuring compliance in value transfer processes, clarifying risk-sharing rules within collaborative mechanisms through technology empowerment, and safeguarding data security and application compliance.

The core information resources in real estate marketing can be categorized into three major types: customer and market resources, product and asset resources, and process and operational resources. These three categories of resources support and synergize with each other, collectively forming the core framework of the real estate marketing information system.

Table 2.18- Classification Table of Core Information Resources for Real Estate Marketing

Classify	Content and Purpose	Main sources
Customer and Market Resources	Customer insight, market analysis and competitive intelligence.	CRM, third-party data, and public opinion tools.
Products and Asset Resources	Product display, design, and asset management.	Design software, and asset management information systems.
Process and operational resources	Process optimization, sales empowerment and knowledge management.	Project management system and knowledge base.

Customer and market resources form the foundation of precision marketing and trend forecasting, encompassing individual customer data, market environment data, and community sentiment data. These resources primarily originate from CRM systems, third-party data sources, and sentiment analysis tools, constituting the core basis for customer insights, market analysis, and competitive strategy formulation.

Product and asset resources serve as fundamental components for building product experiences and evaluating asset value, encompassing physical attribute data, spatial experience metrics, and operational performance data. These resources primarily originate from design software, and asset management platforms, providing

essential support for product presentation design and asset management. Establishing comprehensive commercial real estate information systems is crucial for enhancing market transparency and aiding investment decision-making. The practices of Singapore's Real Estate Information System and the National Council of Real Estate Investment Fiduciaries in the United States offer valuable references: The former, government-led, integrates public data on land, transactions, and pricing and makes it industry-wide accessible; the latter, industry-driven, focuses on standardized collection and sharing of commercial real estate investment performance data. These two models provide exemplary frameworks for developing information systems tailored to diverse scenarios.

Processes and operational resources are critical elements for enterprises to transform individual expertise into organizational capabilities. These resources primarily originate from project management systems and knowledge bases, encompassing internal process data and knowledge documents. Their core functions include driving process optimization, empowering sales teams, and facilitating knowledge management.

The classification and organizational framework of core information resources form the foundation, while efficient structuring and dynamic allocation are crucial for unlocking their value. To maximize the value of information resources, it is essential to establish a comprehensive system encompassing 'organizational models - configuration strategies - security mechanisms,' which must align with digital transformation trends while meeting the innovative demands of real estate marketing.

In terms of efficient information resource organization models, two mainstream approaches are predominant. The first is a centralized data platform-driven model that integrates various information resources through a real estate marketing data platform, achieving "centralized storage, unified management, and on-demand retrieval." The second is a business scenario-oriented modular approach, which constructs information resource packages tailored to specific operational contexts. Each module comprises core data, analytical tools, and scenario-customized application templates. For instance,

the "Green Marketing Innovation Module" combines green technology data with ESG certification information, enabling rapid deployment of green marketing initiatives.

There are four core types of information resource adaptive configuration strategies.

Table 2.19- Comparison of Appropriateness Configuration Strategies for Real Estate Marketing Information Resources

Configuration Policy	Core Logic	applicable scene
Precision fit	Customize resources according to specific customer and project requirements.	Targeted marketing campaigns for different product lines.
Dynamic adaptation	Flexibly adapt to changes in market, policy, and innovation.	Policy transformation, technological updates, and innovation trials.
Coadaptation	Optimize resource allocation for internal and external collaboration.	Cross-departmental or partner (e.g., e-commerce/supplier) projects.
Value-driven adaptation	Prioritize the provision of high-value resources for core initiatives.	Key initiatives include digital marketing campaigns or flagship product launches.

The precision coordination strategy is grounded in customer segmentation and project positioning, delivering customized differentiated information resources. For instance, basic demand projects prioritize cost-effectiveness and commuting convenience metrics, while premium upgrade projects emphasize community ambiance and green building certifications. Investment-oriented projects focus on regional development potential and rental income projections.

Dynamic adaptation strategies enable flexible resource allocation adjustments in response to market fluctuations, policy changes, and innovation developments. Wen Xiaoyan (2025) highlights that digital marketing middle platforms facilitate dynamic resource optimization to swiftly adapt to policy shifts. For instance, during regulatory tightening periods, these strategies increase allocation of compliance-focused marketing materials; leverage digital technology upgrades to enhance data-driven

analytics tools; and optimize market feedback data distribution during the trial-and-error phase of innovative solutions.

Collaborative adaptation strategies optimize resource allocation by coordinating internal and external information resource demands. Wang Lishuang (2021) emphasized that industry-finance integration facilitates rational distribution of shared information resources within enterprises. Internally, strategies allocate shared information resources to various departments; externally, value co-creation is achieved through resource sharing with partners. For instance, real estate developers may share customer profile data with e-commerce platforms, which then provide targeted traffic resources, enabling synergistic optimization of internal and external resources.

Value-driven adaptive strategies enhance resource allocation efficiency by prioritizing high-value information resources. This approach establishes an information resource valuation system with regular assessments to precisely channel premium resources into core innovation projects and critical business scenarios. Hang Zuqing (2022) demonstrated that directing high-quality data resources toward digital marketing innovation initiatives can significantly boost ROI. For instance, in digital marketing innovation projects, high-value assets such as accurate customer profiling data and AI analytics tools are consistently prioritized for resource allocation.

To ensure systematic organization and allocation of information resources, it is essential to establish a comprehensive safeguard mechanism encompassing four core components. Regarding institutional safeguards, a robust information resource management system and data security protocols must be implemented, clearly defining rules and accountability for information collection, storage, sharing, and usage while strictly complying with regulations to protect customer privacy and trade secrets. For personnel safeguards, cross-disciplinary professionals skilled in information resource organization, analysis, and application should be cultivated, alongside enhanced staff training in information literacy to improve overall resource utilization capabilities.

The essence of real estate marketing innovation lies in transcending conventional value creation models, with structural optimization serving as the core foundation for

achieving such breakthroughs. As previously discussed, current real estate marketing processes suffer from structural deficiencies including "poor coordination, inadequate technical support, and low standardization levels," all of which hinder innovation progress. Through three key dimensions - optimizing foundational conditions, enhancing operational efficiency, and strengthening risk management - structural optimization provides robust support for innovation implementation. Its operational mechanism follows a sequential pathway: structural optimization→capacity building→innovation implementation.

Structural optimization lays the foundation for innovative implementation. The modular architecture supports agile innovation by breaking down marketing processes into standardized modules, enabling rapid deployment of innovative models through modular recombination. Fu Zisheng's (2025) research demonstrates that the modular architecture of financial shared service centers facilitates swift restructuring of marketing processes and enhances innovation implementation efficiency—a conclusion consistent with the core tenet of M. & Champy's (2001) process reengineering theory: "Modular recombination boosts organizational agility." For instance, green marketing innovations can be rapidly established through a modular combination of "green value discovery + green channel promotion + green certification coordination," while digital marketing innovations can be systematically constructed using a framework integrating "data collection + AI profiling + precise targeting." Collaborative structures break down internal departmental barriers and external collaboration obstacles, providing a resource integration foundation for cross-boundary innovation.

Structural optimization enhances innovation implementation efficiency, while process node optimization reduces trial-and-error costs. By streamlining redundant procedures and clarifying core responsibilities to establish a "flattened" workflow structure, organizations can effectively minimize approval processes and communication costs during innovation implementation. For instance, in channel innovation initiatives, integrating multi-channel data through collaborative

frameworks enables rapid identification of high-performing channels, optimized resource allocation, and avoidance of resource wastage caused by reckless innovation attempts.

Structural optimization can reduce the risks associated with innovation implementation, while a risk management framework effectively mitigates inherent uncertainties during the innovation process. By embedding risk control mechanisms at various stages, enterprises can achieve comprehensive management throughout the entire process, encompassing "pre-event warning, real-time monitoring, and post-event analysis ".

The evolution of real estate marketing processes demonstrates three core dynamic trends: an immersive shift from information transmission paradigms to experience-driven frameworks, an intelligent transition from broad coverage strategies to precision targeting approaches, and a community-oriented restructuring from transactional closed-loop models to relationship-based closed-loop systems.

Table 2.20-Comparison of Three Major Trends in Real Estate Marketing

Trend	Core change	Key drivers
Experiential	From "Information Browsing" to "Immersive Experience" (such as virtual reality (VR) tours, digital community previews)	Customers need intuitive experiences to reduce decision-making risks.
Intellective	Automate and optimize delivery, service, and follow-up (such as programmatic advertising, AI support)	High procurement costs have driven efficiency improvements through technological empowerment.
Socialization	From "Contract Signing" to "Community Co-construction" (such as homeowners' clubs, offline events)	Competing for loyalty; community building fosters long-term trust and shared values.

The core mission of marketing processes is transitioning from one-way information dissemination to creating multi-dimensional, interactive immersive experiences. This transformation is exemplified through integrated technologies such as VR/AR property tours, digital twin community explorations, and immersive model

home demonstrations. The key driver behind this shift lies in the profound evolution of consumer decision-making logic: in highly uncertain environments, consumers increasingly seek emotional resonance and tangible certainty. Meanwhile, advancements in mobile internet bandwidth, reduced graphics processing costs, and the rise of metaverse concepts have not only enabled technical feasibility for such experiential solutions but also fueled market demand.

Meanwhile, the allocation of marketing resources is becoming increasingly refined and automated. Programmatic advertising, AI-powered customer service, algorithm-based customer rating systems, and tiered follow-up mechanisms have now become industry standards. This shift stems from efficiency pressures arising from diminishing traffic dividends and soaring customer acquisition costs. Businesses must strive for maximum return on marketing investments, while advancements in AI and machine learning technologies enable companies to identify patterns, predict consumer behavior, and execute personalized outreach in real-time. The pandemic in 2020 accelerated this trend, with digital marketing approaches like online sales offices, property livestreaming sales, and e-commerce platform collaborations rapidly transitioning from experimental trials to industry norms. Research by Li Xiao (2024) empirically validates this transformational trend in the sector.

Furthermore, the endpoint of marketing processes has shifted significantly from signing sales contracts to building long-term active customer community relationships. This transformation has given rise to new phases including community management, offline customer event planning, and cultivating seed users. Xiao Wanqiu (2024) pointed out that smart community development empowered by new quality productivity can serve as a core vehicle for constructing customer community relationships. Wen Xiaoyan's (2025) research indicates that real estate developers can enhance customer loyalty through community co-creation during the existing customer era. The dual driving forces behind this shift are twofold: Firstly, in the current era of customer competition, the importance of customer lifetime value has become increasingly prominent; secondly, social media deepens people's sense of belonging to

specific communities, making communities based on shared values and lifestyles the most reliable marketing channels and brand moats.

These three major trends collectively paint a future vision: The real estate marketing process will evolve into an 'intelligent experience engine' that automatically identifies potential clients, delivers a seamless high-quality lifestyle journey from online awareness to offline experiences, and ultimately fosters long-term engagement with communities.

Conclusion to the Section 2

Economic globalization has fundamentally reshaped the real estate industry's development landscape through five core dimensions: capital flows, technological innovation, regulatory policies, market competition, and customer demand. The sector now exhibits three defining characteristics: global connectivity, multidimensional integration, and dynamic evolution. Cross-border capital flows have driven diversified financing models for property developers, with leading firms significantly increasing their overseas financing ratios. The cross-border adoption of green technologies and digital tools has restructured project management and operational frameworks. ESG factors have become pivotal in regulatory compliance and international financing, directly impacting developers' funding costs and credit ratings. Market competition has created a new paradigm of "globalized domestic markets and localized international markets," while customer demands demonstrate dual trends: homogeneous green-intelligent solutions coexisting with culturally tailored regional offerings. Concurrently, globalization has introduced five critical operational challenges for developers: intensified financing constraints, fiercer market competition, rising compliance costs, accelerated transformation investments, and accelerated risk transmission. These developments are driving the industry's strategic shift from scale expansion to value creation.

China and Ukraine's real estate markets exhibit fundamental differences in terms of volatility characteristics, core driving factors, and supply-demand logic. Since 2021, China's market has shown a sustained and endogenous one-way downward trend. From 2021 to 2024, cumulative real estate development investment declined by 27.1%, while the sales area and sales value of commercial residential properties fell by 39.65% and 43.14%, respectively. The core drivers include internal factors such as industry deleveraging, reversal of household housing purchase expectations, and demographic changes. The market's core contradiction shifted from oversupply to insufficient effective demand, while developers also faced dual profit pressures from rising construction costs and declining sales prices. In contrast, Ukraine's market demonstrated a nonlinear fluctuation pattern of "steady growth-cliff-like collapse-rapid recovery." In 2022, affected by the Russia-Ukraine conflict, the construction industry production index contracted by 64.8% year-on-year, followed by consecutive double-digit recoveries over the next two years. Market volatility was entirely driven by geopolitical external events, with supply dominated by the resumption and delivery of existing projects. The core contradiction was unstable construction environments rather than insufficient market demand.

During the observation period, the structural evolution of China and Ukraine's real estate markets exhibited completely opposite trends, primarily reflected in two dimensions: property types and residential product structures. The Chinese market has consistently been dominated by residential properties, with residential investment accounting for 75.83% of total investment in 2024, up from 73.57% in 2020. The proportion of residential sales area has remained stable above 83% for an extended period, while investments and sales volumes of non-residential properties such as office and commercial spaces continued to shrink, with declines significantly higher than those of residential categories. The residential market has remained centered on multi-unit commercial residences without undergoing fundamental structural changes. In contrast, the Ukrainian market demonstrated a recovery of non-residential properties far exceeding that of residential properties. By 2024, the output value of non-residential

buildings had rebounded to 94.37% of pre-war peaks, while residential construction output value recovered only to 70.12%. Industrial real estate emerged as the core growth engine of the market, with construction area surpassing pre-war peaks. The residential product structure underwent a fundamental transformation, with the proportion of single-family homes completed exceeding 50% for the first time in 2024, replacing multi-unit residences as the dominant supply type in the market.

The effectiveness evaluation system for marketing BPM in real estate enterprises has established a dual comprehensive assessment framework integrating "core economic indicators + internal/external environmental factors," achieving organic integration of quantitative measurement and qualitative analysis. At the quantitative level, the system focuses on four core dimensions: marketing investment efficiency, sales conversion rate, capital turnover efficiency, and customer value creation. It establishes six key metrics including net profit margin, marketing expense ratio, inventory cycle, cash flow break-even period, CAC, and CLV/CAC ratio. The system specifies calculation formulas, industry benchmarks, and core focus areas for each metric, enabling precise measurement of marketing process input-output efficiency and ultimate profitability. At the qualitative level, it systematically analyzes three external environmental factors - policy regulation, market volatility, and technological innovation - along with three internal environmental factors: organizational structure, corporate resources, and marketing teams. The framework clarifies the impact pathways of each factor across all marketing process stages, providing a comprehensive analytical framework for evaluating BPM's market adaptability, implementation effectiveness, and sustainability.

Current real estate enterprises, particularly small and medium-sized developers, face two critical challenges in implementing marketing BPM: weak market adaptability and inadequate technical support. These interrelated issues create a vicious cycle characterized by strategic misalignment, operational inefficiency, process inconsistencies, and suboptimal results. The lack of market responsiveness manifests through four key problems: delayed demand analysis—over 40% of SMEs still rely on

experience-based decision-making and competitor imitation without dynamic demand tracking mechanisms, leading to product-market mismatches; rigid strategic adjustments –T slow pricing strategies and product updates coupled with redundant approval processes result in missed market opportunities; ineffective channel integration - overdependence on offline channels causes disjointed online-offline operations, high customer acquisition costs, and low conversion rates; and homogeneous marketing content - promotions focus on generic attributes like location and pricing while lacking differentiated brand value communication. Compounding these issues, technical deficiencies, cross-departmental coordination gaps, lack of process standardization, and fragmented supplier management further hinder BPM effectiveness. Data silos remain prevalent, with digital technologies often remaining superficial implementations that fail to deliver end-to-end process empowerment.

Real estate marketing BPM and innovation have established a stable four-dimensional core framework, centered on value creation, supported by collaborative mechanisms and technological empowerment, and governed by risk management as the baseline constraint. These interconnected dimensions form an organic management system through closed-loop coordination. The value creation dimension serves as the core driver, encompassing four critical stages: value discovery, value creation, value delivery, and value monetization. Its essence lies in transforming clients 'deep-seated needs into product and service value, achieving alignment between customer value and corporate value. The collaborative mechanism dimension employs a three-tier framework of internal coordination, external collaboration, and data integration to break down departmental barriers and overcome coordination challenges with external partners, addressing industry pain points such as process fragmentation and high communication costs. The technological empowerment dimension provides core support for digital and intelligent upgrades across marketing workflows through a three-layer architecture of technical tools, data infrastructure, and application scenarios. The risk management dimension establishes a triple-layer control structure for compliance, market, and operational risks, enabling proactive prevention, real-time

monitoring, and post-event traceability through embedded process nodes, ensuring robust constraints for the system's stable operation.

Core information resources in real estate marketing can be categorized into three major types: customers and markets, products and assets, as well as processes and operations. These resources have become pivotal production elements for implementing marketing BPM innovations, with their value realization relying on scientific organizational models, tailored configuration strategies, and robust support mechanisms. In terms of organizational frameworks, the industry has developed two mainstream approaches: The centralized data platform-driven model utilizes a marketing data middleware platform to achieve centralized resource storage, unified management, and on-demand retrieval, catering to comprehensive chain management needs of large real estate developers. The business scenario-oriented modular approach constructs customized information resource packages based on specific operational contexts, meeting the flexible innovation demands of small and medium-sized developers. Regarding configuration strategies, four adaptive approaches have been established: precise coordination, dynamic adaptation, collaborative alignment, and value-driven optimization. These strategies enable differentiated resource allocation based on project positioning, market policy changes, cross-party collaboration requirements, and corporate core strategies. Additionally, four support mechanisms - institutional frameworks, technological infrastructure, talent development, and performance incentives - provide comprehensive support for efficient resource utilization, security management, and value maximization through rule formulation, system integration, personnel training, and performance evaluation systems.

The real estate marketing process management is undergoing three pivotal evolutionary trends that are driving the industry's comprehensive transformation from traditional transaction-oriented models to customer value-driven approaches. First is experiential transformation: The core mission of marketing has shifted from one-way information dissemination to creating multi-dimensional, interactive immersive experiences. Technologies like VR/AR property tours and digital twin community

exploration enable end-to-end immersive experiences ranging from virtual property viewing to future lifestyle scenarios, precisely addressing customers' core needs to reduce decision-making risks and seek emotional resonance. Second is intelligent evolution: Marketing resource allocation has upgraded from broad coverage to precise targeting. Programmatic advertising, AI-powered customer segmentation and intelligent recommendations, along with full-chain conversion funnel monitoring, have achieved automated and refined marketing operations, effectively addressing the industry's pain point of high customer acquisition costs following the decline of traffic dividends. Third is social restructuring: The endpoint of marketing has shifted from signing sales contracts to building long-term customer community relationships and co-creating communities. Through homeowner clubs, community management, and full lifecycle services, businesses deeply tap into customer lifetime value, transforming user communities into the brand's core competitive advantage.

SECTION 3
IMPROVING THE MANAGEMENT SYSTEM FOR MARKETING BUSINESS PROCESSES IN REAL ESTATE ENTERPRISES

3.1 Theoretical Model and Technical Framework of Marketing BPM for Real Estate Enterprises

3.1.1 Objectives of Model Construction

As discussed in Section 1, the essence of BPM is a systematic strategic management paradigm centered on customer value creation and oriented toward the implementation of corporate strategies. However, empirical research in Section 2 reveals that Chinese real estate companies currently face a prominent disconnect among the four key elements - "strategy, process, organization, and IT" - in their marketing BPM practices: strategic objectives fail to be effectively translated into process design principles; process designs are mismatched with organizational structures; and IT system development lacks effective integration with business needs. Specifically, nearly 40% of small and medium-sized real estate firms still rely on experience-based decision-making, resulting in delayed demand insights; over half of these companies exhibit rigid pricing strategies and lengthy decision cycles, leading to missed market opportunities; data remains fragmented and isolated, hindering cross-departmental process collaboration.

The root of this dilemma lies in the absence of a theoretical framework and technical support system capable of integrating the four key elements - strategy, processes, organization, and technology - and guiding enterprises in systematically implementing Marketing BPM. Pure theoretical models are difficult to implement, while standalone technical applications lack clear direction. To address this, this section integrates the theoretical model with the technical framework to develop a comprehensive solution spanning from "top-level design" to "technical implementation." This solution is systematic, coordinating the four elements to avoid

fragmented improvements; dynamic, enabling agile process restructuring in response to internal and external changes (e.g., policy adjustments, market fluctuations, corporate strategic transformations); and technically actionable, ensuring operational feasibility through seamless integration of the theoretical model and technical framework.

3.1.2 Dynamic Optimization Model for Real Estate Company Marketing BPM

(1) Overall Model Architecture and Technical Support Logic.

The dynamic optimization model for real estate enterprise marketing BPM developed in this paper constitutes a bidirectional closed-loop digital marketing management system guided by management theory and supported by a technical framework. It consists of two primary layers: the theoretical model layer (the management core) and the technical framework layer (the implementation vehicle). Through their mutual interaction of "directional guidance and implementation support," these layers form a complete management iteration cycle. The core logic can be summarized as an organic integration of "one core, two cornerstones, three engines, and one closed loop."

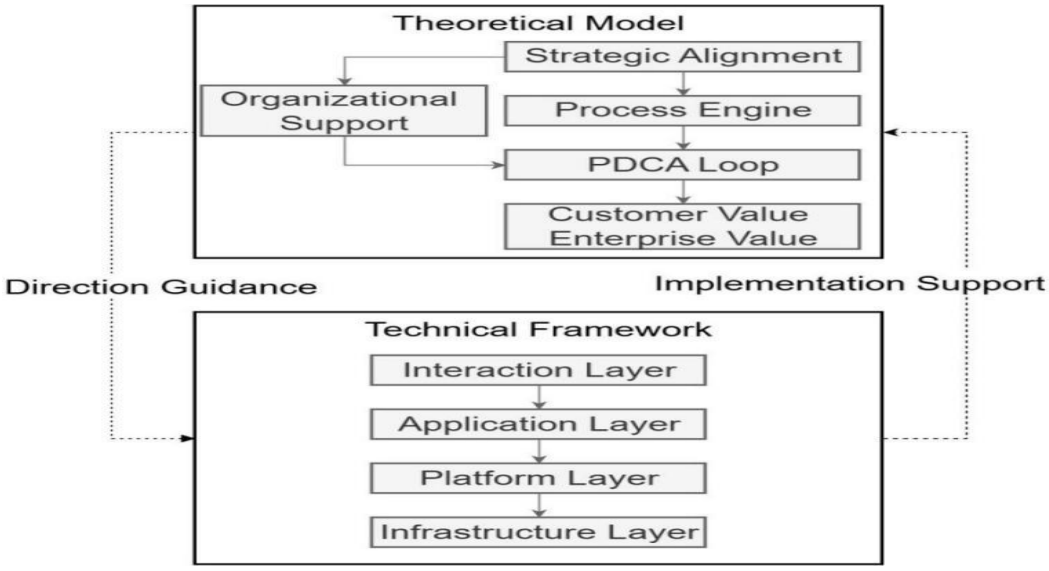

Figure 3.1- Logical Relationship Between Theoretical Model and Technical Framework

Source: Compiled and constructed by the author

The theoretical model layer serves as the strategic and managerial core of the entire architecture, defining the objectives, pathways, and safeguard mechanisms for optimizing real estate marketing processes. Its ultimate goal is the synergistic enhancement of both customer value and corporate value. All marketing process optimization activities are evaluated based on their simultaneous improvement of customer experience and business performance: customer value is measured through satisfaction scores, Net Referral Value (NRV), and referral rates, while corporate value is assessed via net profit margins, inventory turnover cycles, and payment collection cycles. Strategic alignment and organizational support form the two cornerstones of model implementation. Strategic alignment, as the foundational starting point, ensures that marketing process design aligns closely with the company's overarching strategy - including rapid turnover, premium development, and long-term ownership operations - by translating corporate strategies into process design principles and core KPIs. Organizational support provides institutional, cultural, human, and resource backing for process execution, including clarifying process ownership, forming cross-functional teams, and ensuring proper alignment of authority and responsibilities. The process engine, technology engine, and data engine form the three core drivers of the model. The process engine establishes a standardized marketing operation framework based on the "three-layer, five-stage + KCP" approach; the technology engine leverages tools such as CRM, Marketing Technology (Martech), and VR/AR to enable automated and intelligent marketing execution; the data engine provides data support for marketing decisions through the Customer Data Platform (CDP), BI systems, and AI algorithms; the PDCA cycle serves as a closed-loop mechanism for continuous optimization, driving the coordinated operation of the three engines under the guidance of strategic alignment and organizational support, and achieving dual growth in customer and corporate value through the full-cycle iteration of PDCA.

The technical framework layer serves as the digital foundation for implementing theoretical models, adopting a top-down hierarchical architecture that provides end-to-end technological support for the three core engines. The interaction layer acts as the

direct interface between marketing processes and customers, handling customer needs, marketing outreach, online property viewing operations, and other functions - serving as the primary medium for customer value perception. The application layer delivers specific marketing functionalities, including CRM systems, marketing automation platforms, and VR/AR immersive property viewing tools, acting as the technical implementation layer for management logic. The platform layer functions as a centralized support infrastructure comprising CDP, BI systems, and AI algorithm platforms, enabling unified customer data management and reusable technical capabilities. The infrastructure layer encompasses servers, networks, cloud resources, and other underlying IT facilities, ensuring stable and efficient operation for upper-layer applications and platforms. The bidirectional synergy between these two layers achieves deep integration of theory and technology: the theoretical model layer provides strategic and managerial guidance at the lower level to prevent technological-discovery business disconnects, while the technical framework layer ensures implementation feasibility and feeds operational data back into the PDCA cycle to drive continuous model optimization and upgrades.

The correspondence between model elements and institutional design is shown in Table 3.1:

Table 3.1- Correspondence between Model Elements and Institutional Design

Model Element	Core content	Relevant system type	Key aspects of the system
Core Layer	The alignment of customer value and corporate value	Marketing Strategy Management System	Establish strategic objectives that are oriented toward delivering clear customer value
Strategy Alignment Layer	Strategy→Process Principles→KPI	Marketing Process Design System	Strategic Implementation and Standardized Process Design
Organizational Support Layer	Process Owner, Cross-functional Team	Organizational Coordination and Management System	Process Owner, Collaboration Mechanism
Process Engine	Standardized process + KCP	Process Standardization	SOP, Critical Control Point

Model Element	Core content	Relevant system type	Key aspects of the system
Technology Engine	CRM、Martech、VR/AR	Digital Marketing Management System	System Application Specifications, Data Management
Data Engine	Data Middle Platform, BI, AI Analysis	Data Governance Framework	Data collection, analysis, and application
PDCA closed loop	Design-Execution-Monitoring-Optimization	Process Performance Management System	Monitoring indicators, improvement mechanisms

(2) Key Mechanism Design of the Model.

Organizational Mechanism: Process Architecture and Cross-Functional Collaboration. The core of the organizational mechanism lies in translating process design into concrete organizational responsibilities and collaborative protocols. An enterprise-level marketing process framework is established based on the "Three Levels, Five Stages" model, clearly defining the role boundaries at each level: The strategic level involves the Group Marketing Center formulating strategies, approving annual roadmaps, and overseeing key KPIs; the management level includes regional/project marketing leaders developing project plans, allocating resources, and monitoring execution; the operational level sees frontline teams executing activities such as research, promotion, sales, and service according to Standard Operating Procedures (SOPs). Additionally, an integrated end-to-end customer journey map covering "Marketing–Sales–Service" is developed, encompassing five stages - awareness, consideration, purchase, delivery, and post-purchase support - with clearly defined customer touchpoints, responsible departments, information flow paths, and collaboration nodes for each phase. For example, during lead acquisition and nurturing, the marketing department captures leads through digital channels; the CRM system automatically scores these leads, prompting sales teams to initiate initial follow-ups within 24 hours while synchronizing customer preference data with field reception teams. Furthermore, standardized SOPs are established for each critical process node, specifying node names, input/output requirements, operational steps, responsible

positions, completion timelines, quality standards, and exception handling procedures. Taking "Compliance Review of Marketing Content" as an example, a review process is triggered before content publication: preliminary review by business departments→secondary review by legal teams→final approval by divisional leaders, with a 24-hour review time-frame guided by advertising laws and real estate advertising regulations. Content requiring modification is returned or prohibited from publication if non-compliant.

Strategic Mechanism: Strategic Implementation and Dynamic Alignment. The core of the strategic mechanism lies in ensuring that process design serves the achievement of corporate strategic objectives. First, establish a strategic implementation mechanism by breaking down the overall corporate strategy into design principles and core KPIs for marketing processes. The differentiation orientations under different strategic models are shown in Table 3.2.

Table 3.2- Design Orientation of Marketing Processes Under Different Strategic

Strategic Model	Core Objective	Process Design Principles	Core KPI	Process Focus
Fast turnover model	Fast capital turnover and scale expansion	Standardized, replicable, and highly efficient	Inventory cycle, payment collection cycle, marketing expense ratio	Pre-sales planning, channel management, and launch conversion
Premium development model	Brand premium and differentiated competition	Customized, experience-focused, and high-value	Net profit margin, customer satisfaction, referral rate	In-depth customer segmentation research, community-based marketing, and customized services
Adopt an operational model	Stable cash flow and asset appreciation	Service-oriented, long-term, and refined	Rental rate, renewal rate, rent per unit area	Tenant acquisition, operational services, and community maintenance

Simultaneously, establish a dynamic strategic-process alignment mechanism. When the enterprise undergoes strategic transformation or significant changes in the external environment, the process system can respond swiftly. Specific measures

include: establishing a Strategic Process Committee composed of heads from the strategy, marketing, operations, and IT departments to review quarterly the progress of strategy execution and process support; implementing a process version management system that enables rapid iteration of individual processes while maintaining the stability of the core framework; and designing flexible process parameters—for example, allowing pricing approval authority to be dynamically adjusted based on market changes and channel budget allocation to be optimized according to ROI performance.

Information Mechanism: The Processual Implementation of the PDCA Cycle.

The core of the information system lies in institutionalizing the PDCA cycle as a standardized process management procedure. During the planning phase, process optimization plans are developed annually or quarterly, specifying optimization objectives, responsible parties, and timelines, with performance targets for each core process aligned with strategic KPIs. In the execution phase, processes are carried out according to SOPs, while critical data such as time spent at each stage, abnormal events, and customer feedback are recorded through the IT system. In the review phase, a process performance monitoring dashboard is established to regularly analyze performance metrics, identify anomalies and bottleneck areas, and implement alert rules (e.g., automatic alerts triggered when the contract conversion rate remains below 10% for two consecutive weeks). During the resolution phase, diagnostic analyses are conducted for identified issues, improvement measures are formulated and implemented, and validated solutions are updated into SOPs and institutionalized via the IT system to prevent recurrence.

Table 3.3- Example of Core Process Performance Monitoring

Process Name	Clue Acquisition Process	Locus Incubation Process	Property conversion process
Key index	Cue Volume	Lead-to-Visit Conversion Rate	Visit-to-Pre-order Conversion Rate
Target value	500 items per week	12%	20%
Actual amount for this period	420 items/week	8%	22%
Bias in statistics	-16%	-33%	10%
Abnormal Alert	detonate by contact	detonate by contact	normal
Responsible department	Digital Marketing Department	sales department	Property Manager
Corrective actions	Optimize your advertising strategy	Optimize follow-up scripts and increase contact frequency	The experience has been solidified and promoted

3.1.3 Framework for Empowering Real Estate Intelligent Marketing Technology

The technology empowerment framework serves as the core support for model implementation. This study establishes a four-tier technical architecture that ensures comprehensive coverage across the entire process, from customer engagement to data intelligence.

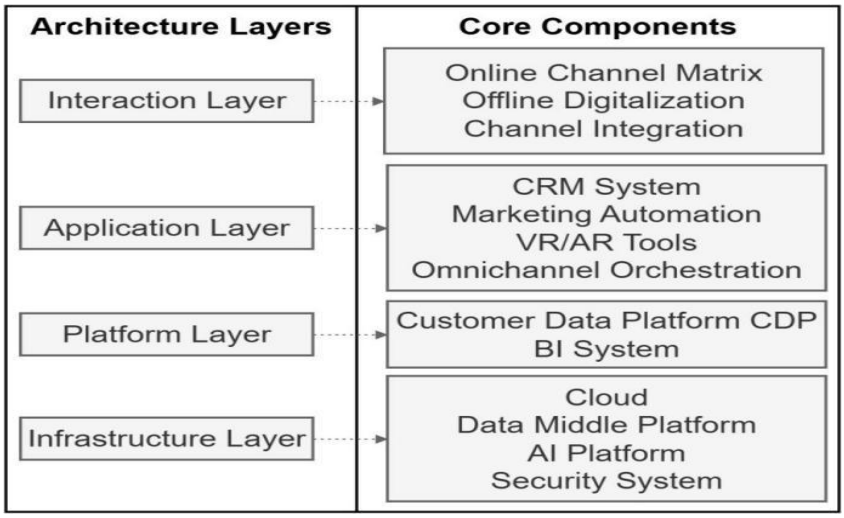

Figure 3.2- Architecture Diagram of Intelligent Marketing Technology Empowerment

Source: Compiled and constructed by the author

(1) Interaction Layer: Integrated Omnichannel Customer Touchpoints.

The interaction layer serves as the interface through which customers directly engage with enterprises, responsible for achieving omnichannel customer reach and experience delivery. The online channel matrix centers around the official website, supplemented by third-party platforms such as WeChat Official Accounts, Mini Programs, TikTok/Kuaishou, Xiaohongshu, and Beike/Anjuke. A unified content management platform enables one-time content creation and multi-channel distribution: the official website hosts in-depth content presentation and lead conversion, social media drives brand exposure and interactive traffic generation, while third-party platforms facilitate targeted customer acquisition. For offline channel digitization, sales offices deploy intelligent reception systems (e.g., Mingyuan Cloud Guest's smart badges and facial recognition visitor systems) to automatically identify, register, and assign visiting clients. At event venues, offline interaction data is digitized through QR code check-ins and electronic tickets; smart badges record reception duration and speech script compliance, providing data support for service quality management. Channel data integration synchronizes real-time data from various channels to the CDP via Application Programming Interface (API) interfaces—for example, customer behavior data generated after clicking ads on TikTok automatically enters the CDP, while facial recognition or QR code scanning upon client visit to the sales office automatically links their online activity records. The core objective is to achieve cross-channel customer identification, ensuring comprehensive tracking of a single customer's behaviors across all channels.

(2) Application Layer: Automated Execution of Marketing Operations.

The application layer serves as the core execution layer for marketing process automation, integrating CRM systems, marketing automation platforms, VR/AR experience tools, and programmatic advertising systems. The CRM system enables comprehensive customer lifecycle management: Using ETL tools, it cleans, ded duplicates, and matches customer behavior data, sales follow-up records, transaction data, and service information from the interaction layer to establish a unique customer identification (One ID) system and customer attribute tags (age, purchase motivation,

price sensitivity, etc.), while documenting customer behavior trajectories. Within the CRM, sales stages are configured (lead→intent→visit→reservation →purchase→signing→payment), with the system automatically advancing stages based on customer behavior, calculating conversion rates, and generating visual funnel charts that trigger automatic alerts when rates fall below thresholds. A lead scoring model incorporating behavioral, attribute, and interaction dimensions assigns leads based on total scores (high scores go to premium sales representatives, while lower scores enter an automated incubation pool). The incubation process automatically delivers project highlights, VR property tours, customer testimonials, and promotional offers. Additionally, the CRM provides mobile applications for frontline sales teams, supporting customer information queries, follow-up tracking, sales script recommendations, competitor comparisons, and sales performance evaluation records. The Marketing Automation Platform (MAP) handles the automated execution of marketing campaigns: integrating with platforms like Tencent Ads and Jumei Engine to deliver programmatic ads, enable real-time bidding, and manage budgets; configuring event triggers (e.g., automatically sending materials after 3-minute property viewings, sending reminders after pre-orders without signing, or delivering services post-signing); establishing a unified content library (including images, videos, and VR content) that can be automatically accessed across multiple channels after tagging. VR/AR technology addresses the perception barriers of real estate products' "immobility" and "heterogeneity": professional panoramic cameras capture model units, generating VR tours for first-person viewing via VR headsets or mobile devices; AR-based 3D modeling displays property layouts with layered visualization upon scanning; BIM enables digital twin community modeling, providing comprehensive insights and flow simulations from macro to micro perspectives. Omnichannel synergy ensures seamless data integration and business coordination: online leads are instantly synchronized to CRM for automated follow-up, while offline visits trigger subsequent online tasks upon QR code scanning; CRM integration with ERP, financial, and customer service systems achieves synchronized marketing budgeting, payment

reconciliation, and automated case routing; an ROI evaluation model visualizes channel costs, conversion rates, and customer value through BI systems, supporting optimized channel investment decisions.

(3) Platform Layer: Data Integration and Capability Sharing.

The platform layer serves as the core of the technology-empowered framework, responsible for unified data management and shared capability delivery. The CDP, acting as the central hub for marketing data, performs three primary functions: data ingestion (integrating CRM data, interaction layer behavioral data, and external third-party profiles and social data); data processing (data cleansing, customer tagging system modeling, customer segmentation model development, and unified data storage); and data services (providing customer profiling APIs, segmentation APIs, and behavioral analysis APIs for upper-layer applications). The BI system enables visual analysis and decision support for marketing data by delivering KPI dashboards at the group, regional, project, and team levels, showcasing key metrics such as sales volume, conversion rates, marketing expense ratios, payment collection rates, lead counts, and conversion rates. It establishes a comprehensive funnel analysis covering "exposure→leads→visits→inquiries→signings→payments," supporting drill-down queries by channel, project, and time dimensions against target benchmarks. By tracking customer conversion paths and calculating channel contribution rates, the system provides actionable insights for budget optimization.

(4) Infrastructure Layer: The Technical Foundation.

The infrastructure layer provides computing, storage, networking, and security safeguards for upper-layer applications. Cloud services utilize public cloud infrastructure, with elastic computing resources supporting concurrent access during peak marketing activity periods. Object storage stores large files such as VR content and videos, ensuring system stability and scalability. The data middle platform, built on a big data platform, enables real-time processing and offline analysis of massive behavioral data, offering capabilities in data development, data quality management, and data asset management to deliver unified data services for upper-layer applications.

The AI algorithm platform, leveraging a machine learning framework, supports the training, deployment, and online inference of lead scoring models, customer segmentation models, and dynamic pricing models, enabling intelligent marketing decision-making. The security architecture encompasses transmission encryption, storage encryption, regular security scans, and customer sensitive information desensitization.

The preceding section systematically elucidates the functions and implementations of the interaction layer, application layer, platform layer, and infrastructure layer from a layered architecture perspective. To more clearly illustrate how key technologies are applied in real estate marketing, the following analysis focuses on four core technological modules - CRM systems, big data analytics, immersive experience technologies, and omni-channel marketing automation - tracing their evolutionary path from basic applications to intelligent enhancements.

These four major modules are not isolated but closely aligned with the preceding architecture: The CRM system serves as the core platform for application-layer marketing automation; big data analytics leverages CDP, BI, and AI algorithms at the platform layer to deliver customer insights and decision support; VR/AR technology functions as an immersive experience tool at the application layer to overcome product perception barriers; while omni-channel marketing automation spans both the interaction and application layers, enabling seamless integration of online and offline data and business synergy. Each module progresses through a hierarchical progression of "basic→advanced→deepened→intelligent," forming a capability enhancement path from data accumulation to value creation. The detailed deepening path is outlined in Table 3.4.

Table 3.4- Deepening Pathways for Application of the Four Major Technical Modules

Technical Module	Application Level	Function Implementation	Output Value
CRM system	Base Layer	Customer Information	Transforming customer data

Technical Module	Application Level	Function Implementation	Output Value
		Management	into assets
	Enter the social class	Sales Funnel Management	Visualize the sales process
	Deepening Layer	Score Evaluation and Incubation	Improved customer acquisition efficiency
	Intelligent Layer	Sales Empowerment	Enhanced sales capabilities
Big Data Analysis	client portrait	Cluster analysis, RFM model	Precision Marketing
	Regional Assessment	Spatial Analysis, Time Series Analysis	project positioning
	Dynamic Pricing	Regression Analysis, Machine Learning	One-price-per-unit strategy
VR/AR	VR panoramic property tour	Panoramic shooting and interactive point placement	Overcoming the limitations of time and space
	AR Unit Layout Display	3D modeling, AR development	Intuitive understanding of the apartment layout
	Digital Twin Community	BIM	Immersive Roaming
Omnichannel Automation	Channel Collaboration	Unify customer IDs and synchronize data	Experience Consistency
	Online-Offline Collaboration	Scan to check in, automatic push notifications	Improved conversion efficiency
	Business-Finance Collaboration	CRM and ERP Integration	Integration of Business and Finance

The aforementioned deepening pathways demonstrate that the maturity of the four major technical modules evolves in a stepwise manner: CRM systems progress from basic information recording to intelligent sales empowerment; big data analytics upgrades from static customer profiling to dynamic pricing decisions; VR/AR expands from single-point displays to full-community digital twins; and omni-channel automation advances from single-channel collaboration to an integrated business-finance closed-loop system. These pathways align seamlessly with the bidirectional

support logic of "theoretical model→technical framework" discussed earlier, collectively forming the technical implementation framework for the dynamic optimization model of marketing BPM in real estate enterprises.

3.1.4 Implementation Roadmap and Institutional Design Principles for the Technology Empowerment Framework

To ensure the effective implementation of the technology empowerment framework and support it with corresponding management mechanisms, this study proposes a phased implementation roadmap and five key institutional design principles. Enterprises can flexibly adjust the implementation pace according to their specific circumstances and establish an appropriate institutional framework.

(1) Phased Implementation Roadmap Design. The first phase is the foundational construction phase: deploying the CRM system, completing customer data import and historical data cleansing; establishing an online channel matrix (official website, WeChat public account, mini-program, etc.); piloting VR property viewing production and application; establishing basic data collection standards and clarifying data specifications. The second phase is the deepened application phase: achieving automated management of the CRM sales funnel; developing a lead scoring model and automatic assignment mechanism; building a CDP to integrate cross-channel data; and enabling seamless integration of online/offline data and business processes. The third phase is the intelligent upgrade phase: deploying a BI system, creating a marketing KPI dashboard; implementing programmatic advertising campaigns with performance monitoring; establishing dynamic pricing models to support pricing strategy formulation; and achieving omnichannel marketing automation and collaboration. The fourth phase is the continuous optimization phase: ongoing training and iterative refinement of AI models; expanding RPA applications for process automation; deepening the value extraction from data assets; and refining supporting management systems. Enterprises can choose to start with any phase or advance multiple phases concurrently based on their digital foundation, organizational capabilities, and resource

availability. This implementation roadmap serves as a general framework, requiring adjustments tailored to specific organizational contexts during execution.

(2) Principles of Institutional Design. Based on the aforementioned theoretical model and technical framework, five fundamental principles have been established for designing BPM systems in real estate enterprise marketing. Principle 1: Strategic Orientation - All marketing process systems must align with corporate strategy; fundamentally different approaches should be adopted between fast-turnover enterprises and premium development enterprises. The systems should clearly outline strategic implementation pathways by breaking down strategic objectives into process KPIs. Principle 2: Customer-Centric Approach - System design prioritizes customer value creation over internal management efficiency; all process nodes should be evaluated based on customer experience, with customer satisfaction serving as the core metric. Principle 3: Responsibility-Allocation Principle—Systems must specify responsible entities, authority boundaries, and collaboration requirements for each process node; process ownership mechanisms should be formally documented to ensure accountability. Principle 4: Standardization First—Core processes must be supported by SOPs, with clear quality standards defined for critical control points; systems should establish procedures for SOP development, approval, publication, and updates. Principle 5: Continuous Improvemen - Systems should incorporate a PDCA cycle mechanism, specifying monitoring frequencies, anomaly alert thresholds, and reporting/treatment protocols for process performance enhancements.

3.2 Verification of the Effectiveness of Optimization Measures

3.2.1 Verification Scheme Design

Building upon the dynamic optimization model and technology-enabled framework for real estate marketing BPM established in Section 3.1, this section conducts empirical testing using a non-equivalent controlled before-and-after experimental design. By rigorously controlling for confounding variables and

endogeneity issues, it accurately measures the net effect of optimization measures, providing empirical support for subsequent institutional design.

(1) Verification Framework. Building upon the core objective of the theoretical model in Section 3.1 (the dual enhancement of customer value and corporate value), we have developed a three-tier progressive validation framework comprising the "Operation Layer - Result Layer - Value Layer." This framework encompasses key metrics across all process dimensions while aligning with verification cycles that are observable in the short term and traceable over the medium to long term. The specific design is as follows:

Table 3.5- Verification Framework and Core Design

Verification Level	Core Indicator	Corresponding optimization measures	Verification Period
Process Assurance Layer (Strategic-Organizational Alignment)	Implementation rate of strategic initiatives, convening rate of cross-functional meetings, performance evaluation of process owners	The Strategic Process Committee system, the cross-functional team mechanism, and the process owner accountability system	complete period
Operation Layer (Process Timeliness)	Customer follow-up timeliness, approval process timeliness, lead processing timeliness	Automated CRM assignment and reminders, process automation and mobile approvals, implementation of standardized SOPs	Short-term (8 weeks)
Operation Layer (Process Quality)	Contract error rate, Price error rate	Standardized templates and system validation; implementation of a "one room, one price" mechanism within the system.	Short-term (8 weeks)
Result Layer (Customer Experience)	Project site satisfaction, contract signing satisfaction	VR/AR immersive experiences, standardized reception procedures, electronic signing, and streamlined processes	Short-term (8 weeks)
Value Layer (Operational Efficiency)	Monthly sales conversion rate, average collection cycle, marketing expense ratio	Omnichannel marketing automation, lead scoring and incubation, strategic-process dynamic matching mechanism	Medium to long term (24 weeks)
Dynamic Optimization Layer	Number of process iteration cycles, problem response time, model optimization frequency	PDCA Closed-Loop Optimization Mechanism	complete period

(2) Mapping relationship between validation indicators and technical measures.

To precisely identify the independent effects of optimization measures and avoid confounding attributions from multiple variables, a one-to-one mapping relationship between indicators and technical measures was established, clarifying the core driving

factors and mechanisms of each indicator as shown in the table below:

Table 3.6- Mapping Table of Verification Indicators and Technical Measures

Verification Level	Verification Indicator	Corresponding technical measures	Technical Mechanism of Action
Process Efficiency	Customer follow-up timeliness	Automatically assign CRM leads and send automatic follow-up reminders	The system automatically eliminates delays in manual distribution, and standardized reminders ensure timely sales responses, reducing human oversight.
	Approval process timeline	Process flow node consolidation and parallel approval, mobile approval via mobile devices	Replace sequential approvals with parallel approvals, overcome office scenario limitations on mobile devices, and reduce unnecessary waiting times
Process Efficiency	lead processing efficiency	Automatically deduplicate, score, and assign CRM leads	The system automatically completes the entire lead processing workflow, eliminating the time-consuming and error-prone manual sorting and assignment.
Process Quality	Contract Error Rate	Standardized contract template system integration, automatic field population for key fields, and system validation	The system locks core fields and automatically populates customer, property, and price information, reducing manual entry steps and preventing errors through upfront validation.
	Price Error Rate	The system standardizes the "one room, one price" pricing structure and automates discount calculation rules.	The price list becomes locked after approval and cannot be modified manually. Discount rates are automatically calculated by the system, eliminating input and calculation errors at the source.
Customer experience	Project Site Satisfaction	VR/AR immersive property viewing tool and standardized end-to-end reception SOP	VR/AR overcome product perception barriers, standardized processes ensure service consistency and professionalism, and enhance the stability of customer experience.
	Signature Satisfaction	Electronic signing system, simplified signing process, and consolidated nodes	Reduce the waiting time for offline signing, simplify customer procedures, and enhance the convenience of the entire signing process.
Operational Performance	Monthly sales conversion rate, payment collection cycle	Score evaluation and automated incubation, omni-channel collaborative operations	Enhance lead conversion efficiency and accelerate the entire process flow from subscription to payment collection, aligning with the rapid turnover strategic objective.
Process Compliance	Implementation rate of strategic initiatives, convening rate of cross-functional meetings, performance evaluation of process owners	Quarterly review by the Strategic Process Committee, weekly meetings of cross-functional teams, and an evaluation system for process owners	Through process audits of system implementation, ensure that strategic alignment and organizational safeguards have been effectively established as designed, providing a management foundation for the effectiveness of technical measures.

(3) Selection of Pilot Projects. This study selected H Real Estate Group, a medium-sized regional property developer in the third-tier cities of northern Henan Province, as the pilot subject. Using the pairing method, two currently marketed projects with highly matched positioning, scale, and development cycles were chosen and designated as the experimental group and control group, respectively. The specific pairing criteria and design are outlined below:

Pairing Criteria: The two projects must meet the following requirements: located in the same city and district, with identical location amenities and market conditions; both products target first-time homebuyers and primary renovations, with deviations of ≤5% in unit size ranges, total price ranges, and average selling prices; launched simultaneously and both in stable sales periods, with sales progress deviations ≤10%; no statistically significant differences in marketing team size, staff tenure, or baseline performance levels; and no significant variations in core operational metrics during the six months preceding the trial, ensuring baseline consistency.

Block design: Experimental Group (Project A: YunXi): Fully implemented the marketing BPM optimization measures outlined in Section 3.1, including the full deployment of the CRM system modules, implementation of standardized SOPs, restructuring of approval processes, deployment of VR/AR tools, establishment of a "one property, one price" pricing system, and integration of omnichannel data. Only core management personnel (Project Director and Marketing Director) were aware of the experimental purpose; frontline sales teams were not informed and participated in the control experiment, being simply notified that it was part of the "Group's unified marketing process upgrade training." All performance metrics remained evaluated under the original system, with no additional rewards introduced due to the experiment.

Control Group (Project B: HuGuang): Maintain the original traditional marketing management model without implementing any optimization measures; no additional management interventions or team incentives will be conducted during the experiment to eliminate external interference.

Experimental Period: The core indicator validation period spans 18 weeks, comprising the pre-test phase (baseline phase) from weeks 1 to 8, the intervention introduction and stabilization phase from weeks 9 to 10 (data from this phase are excluded from the pre-test and post-test analyses), and the post-test phase (intervention period) from weeks 11 to 18. The operational performance indicators are extended for follow-up until week 24 to verify the medium-and long-term stability of the optimized measures.

(4) Data Collection Method. To ensure the authenticity, traceability, and consistency of data, a comprehensive data collection plan has been established, specifying the data sources, collection frequency, and quality control rules for each indicator, as shown in the table below:

Table 3.7- Data Collection Plan

Verification Dimension	Metric	Data sources	Collection Frequency
Process Efficiency	Customer follow-up timeliness, lead processing timeliness	Complete recordings of CRM system backend logs and sales follow-ups	everyday
	Approval process timeline	Full logs of the OA approval system	everyday
Process Quality	Contract Error Rate	Contract Management System; Legal and Compliance Verification Ledger	weekly
	Price Error Rate	Stock Control System, Price Management Ledger	weekly
Customer experience	Project site satisfaction, contract signing satisfaction	5-point Likert scale questionnaire, QR code scanning for data collection	actual time
Operational Performance	Depreciation rate, collection cycle, marketing expense ratio	ERP Sales System, Financial System	monthly

For Process Efficiency, regarding customer follow-up timeliness and lead processing timeliness, the system automatically extracts timestamps after excluding invalid follow-up data (call durations <30 seconds or interactions without substantive needs), requiring no manual intervention. For the same Process Efficiency dimension, the approval process timeline rule is: approve all types of marketing campaigns, expenses, and price adjustments; calculate the total processing time for each application; and exclude rejected or resubmitted abnormal documents. For Process

Quality, the contract error rate is defined as an incorrect entry or completion of customer information, property details, pricing information, or contractual terms, and the error rate is calculated based on the number of signed contracts. For the price error rate under Process Quality, an error occurs when the system-entered price differs from the approved one-price-per-unit list or when discount calculations are incorrect, and the system performs a comprehensive verification and statistical analysis of all available properties. For Customer Experience, project site satisfaction and contract signing satisfaction are measured using a 5-point Likert scale questionnaire with on-site QR code scanning; the questionnaire demonstrated a Cronbach's α coefficient of ≥0.8 for reliability, a valid response rate of ≥95%, and invalid questionnaires containing identical consecutive options were excluded. For Operational Performance, the depreciation rate, collection cycle, and marketing expense ratio follow the group's unified financial methodology, align with annual budget targets, and ensure consistent data standards.

(5) Statistical Analysis Methods. This study employed SPSS statistical software for data analysis, with an alpha level of $\alpha=0.05$ and a two-tailed test, strictly adhering to the statistical standards for empirical research in social sciences. The specific methods are as follows:

Baseline consistency check: The independent samples t-test (for continuous variables) and chi-square test (for categorical variables) were employed to verify that there were no statistically significant differences in baseline indicators between the experimental group and the control group before the experiment ($p>0.05$), thereby ensuring the validity of the quasi-experimental design.

Normality and homogeneity of variance tests: Continuous variables are expressed as mean ± standard deviation. The Shapiro-Wilk test is used to verify data normality, while the Levene test is employed to assess homogeneity of variance.

Within-group and between-group comparative tests:

For continuous variables that follow a normal distribution with homogeneous variance, paired-sample t-tests were used for intra-group before-and-after comparisons,

while independent-sample t-tests were employed for inter-group comparisons at the same time point. The Cohen's d effect size was also reported to quantify the actual magnitude of differences.

The count data are presented as case counts (percentage), and intergroup comparisons were performed using the Fisher exact test (appropriate for small sample sizes and expected frequencies <5).

Net Effect Identification: A DID model was constructed to control for individual fixed effects and time fixed effects, thereby isolating the impact of common shocks such as market trends and seasonal fluctuations and accurately identifying the net treatment effect of optimization measures. The model specification is as follows:

$$Y_{it}=\beta_0+\beta_1(Treat_i\times Time_t)+\beta_2 Controls_{it}+\mu_i+\lambda_t+\varepsilon_{it} \qquad (3.1)$$

Where:

Y_{it}*: Outcome variable (follow-up timeliness, approval timeliness, lead timeliness, contract error rate, pricing error rate, on-site satisfaction, signing satisfaction)*

$Treat_i$*: Group dummy (experimental=1, control=0)*

$Time_t$*: Time dummy (posttest=1, pretest=0)*

$Treat_i \times Time_t$*: DID interaction term;=net treatment effect*

$Controls_{it}$ *: Team size, affordable housing ratio, weekly regional transaction volume, competitor turnover*

μ_i*: Individual fixed effect*

λ_t*: Time fixed effect*

ε_{it}*: Random error*

Due to limitations in sample size and data availability, this study did not conduct additional placebo controls or heterogeneity analyses. Future research could further investigate the heterogeneous effects and long-term impacts of the optimization measures by expanding the sample size or employing multi-group control designs.

(6) Research Hypothesis.

Based on the theoretical model and technical optimization scheme outlined in Section 3.1, and incorporating the business logic of real estate marketing, the following testable research hypotheses are proposed:

H1: After implementing optimization measures, the customer follow-up response time for projects in the experimental group was significantly reduced.

H2: After implementing optimization measures, the approval process for projects in the experimental group was significantly streamlined.

H3: After implementing optimization measures, the processing efficiency of leads in the experimental group's project was significantly reduced.

H4: After implementing optimization measures, the contract error rate of the experimental group project decreased significantly.

H5: After implementing optimization measures, the price error rate of projects in the experimental group decreased significantly.

H6: Following the implementation of optimization measures, both on-site satisfaction and contract signing satisfaction for projects in the experimental group showed significant improvement.

H7: After implementing optimization measures, the project conversion rate in the experimental group significantly improved, while both the payment collection cycle and the marketing expense ratio markedly decreased.

3.2.2 Case Verification

(1) Overview of Pilot Enterprises and Projects.

H Real Estate Group Co., Ltd. is a medium-sized regional, non-listed real estate developer specializing in third-tier cities across northern Henan Province. Its core business focuses on commercial residential property development, complemented by community commerce and property management services. As of the end of 2024, the company had 13 ongoing and marketed projects with annual sales totaling approximately RMB 6.2 billion and a workforce of 680 employees, including 192 marketing professionals. Prior to the pilot initiative, the company only operated a basic customer information registration system with an utilization rate below 35%, relied

primarily on offline hierarchical approvals for marketing approvals, depended on manual operations for contract and pricing management, and lacked standardized processes across projects. Its digital infrastructure and management practices closely aligned with the industry-wide challenges identified in Section 3.1, making it a representative case for the pilot program. The company maintains an eight-member dedicated IT team capable of implementing optimization measures, while its management demonstrates strong support for BPM-driven marketing reforms, ensuring smooth project execution.

Experimental Project A (YunXi): Located in the core area of the city's eastern district, this development features high-rise residences and mid-rise townhouses with unit sizes of 89 ㎡ (for first-time homebuyers), 115 ㎡ (for first-renovation buyers), and 130 ㎡ (for subsequent renovations). It offers 436 units at an average selling price of approximately RMB8,200 per square meter (unfinished). During the launch phase, the project was in a flat sales period; after six months of operation, it achieved a cumulative sales completion rate of 42%. Its primary target customers include local first-time homebuyers, suburban migrants from neighboring districts, and first-renovation buyers. The marketing team comprises 12 on-site sales representatives, 2 channel specialists, and 2 planners, with an average team tenure of 2.8 years. Throughout the experiment, all process optimization measures outlined in Section 3.1 were fully implemented: during the intervention phase, the CRM system was fully deployed, SOP training was conducted, processes were restructured, and the system was rolled out; the post-test phase strictly adhered to the optimized management framework.

Control Project B (HuGuang): Located 1.2 kilometers from the experimental project in the same eastern urban district, it shares identical location amenities and market conditions. The property type is high-rise residences with unit sizes of 89 ㎡ (first-time buyers), 118 ㎡ (first-renovation buyers), and 132 ㎡ (subsequent renovations), offering 428 units at an average price of RMB8,000 per square meter

(unfinished) - a price deviation of 2.4% from the experimental project. At launch, it was also in a flat sales period; after 5.5 months of operation, it achieved a 40% sales completion rate, with a sales progress deviation of ≤5% compared to the experimental project. Its core customer base closely overlaps with that of the experimental project. The marketing team consisted of 12 field sales representatives, 2 channel specialists, and 2 planners, with an average tenure of 2.6 years among its members. There was no statistically significant difference in team capability baseline compared to the experimental group ($p>0.05$).

Baseline balance test results: During the first 8 weeks of the experiment, there were no statistically significant differences in the overall mean values of core baseline indicators - including customer follow-up timeliness, approval process efficiency, contract error rate, and site satisfaction - between the experimental and control groups (independent samples t-test/chi-square test, $p>0.05$). This meets the baseline comparability requirement of the quasi-experimental design, indicating high comparability between the two groups.

(2) Data Statistics.

This section presents comprehensive statistical data on the core indicators of both the experimental group and the control group during the pre-test and post-test periods, covering three dimensions: process assurance layer, operational layer, and outcome layer. All data are derived from the system backend's original logs and compliance records, with a statistical methodology identical to that defined earlier, as detailed below:

Table 3.8- Verification Results of Process Assurance Layer Indicators

Process Compliance Indicator	Planned value	Experimental group	Completion rate	Control group
Number of quarterly reviews conducted by the Strategic Process Committee	3 times	3 times	100%	1 time
Number of weekly meetings held by the cross-functional team	18 times	17 times	94.4%	6 times
Process Owner Performance Score (5-point scale)	≥4.0 points	4.47 points	-	2.8 points

Table 3.9- Customer Follow-up Time Details (Unit: minutes)

Statistics Period	Mean of Group A	Mean of Group B	Group A Effective follow-up rate within 24 hours
Week 1	62.6	90.3	76.2%
Week 2	81.9	71.5	65.8%
Week 3	73.2	92.1	76.5%
Week 4	92.8	81.7	76.0%
Week 5	83.5	62.4	95.7%
Week 6	92.1	80.9	76.3%
Week 7	83.0	91.8	65.9%
Week 8	92.4	81.2	76.1%
Average of the pre-test period	82.7	81.5	76.1%
Week 11	25.3	90.8	92.3%
Week 12	33.8	81.1	92.7%
Week 13	32.5	70.5	93.1%
Week 14	31.2	81.3	93.5%
Week 15	40.6	85.9	88.8%
Week 16	29.8	81.2	96.0%
Week 17	29.2	74.7	95.2%
Week 18	28.5	82.0	95.3%
Average of the post-test period	31.4	80.9	93.4%
Relative optimization magnitude	-62.1%	-0.67%	+17.3 percentage points

Note: Relative optimization rate=(Post-test mean-Pre-test mean) / Pre-test mean.

× 100%; the same applies below

Table 3.10- Detailed Schedule of Approval Process Duration (Unit: Hours)

Statistics Period	Mean of Group A	Mean of Group B	Group A Proportion of approvals exceeding 48 hours
Week 1	48.6	47.9	72.5%
Week 2	49.2	48.2	73.1%
Week 3	55.8	57.3	69.8%
Week 4	74.7	68.5	53.4%
Week 5	33.9	28.1	81.9%
Week 6	37.1	39.3	83.0%
Week 7	48.8	47.3	79.6%
Week 8	43.5	48.4	70.2%
Average of the pre-test period	49.0	48.1	72.9%
Week 11	18.5	52.8	22.4%
Week 12	13.3	48.1	21.5%
Week 13	17.2	47.6	20.3%
Week 14	20.5	42.2	19.1%
Week 15	13.0	47.9	18.2%
Week 16	18.2	59.1	17.5%
Week 17	12.8	47.7	16.8%
Week 18	17.2	38.0	16.1%
Average of the post-test period	16.3	47.9	19.0%
Relative optimization magnitude	-66.6%	-0.42%	-54.0 percentage points

Table 3.11- Detailed Schedule of Clue Processing Time (Unit: Minutes)

Statistics Period	Mean of Group A	Mean of Group B	Group A Instant allocation rate within 5 minutes
Week 1	76.8	75.2	12.60%
Week 2	91.2	79.3	10.30%
Week 3	66.3	82.3	12.90%
Week 4	77.5	76.1	11.90%
Week 5	81.5	68.9	12.30%
Week 6	76.0	75.7	12.00%
Week 7	69.5	68.1	13.90%
Week 8	77.3	78.3	11.80%
Average of the pre-test period	77.0	75.5	12.2%
Week 11	18.5	75.3	80.70%
Week 12	16.1	81.3	81.60%
Week 13	16.9	88.6	80.30%
Week 14	19.3	75.4	66.90%
Week 15	15.5	62.5	82.90%
Week 16	13.2	75.2	91.60%
Week 17	14.2	69.6	83.80%
Week 18	13.5	75.3	85.60%
Average of the post-test period	15.9	75.4	81.7%
Relative optimization magnitude	-79.4%	-0.12%	+69.5 percentage points

Table 3.12- Statistical Table of Contract Error Rates

Statistics Period	Group A			Group B		
	Number of signatures	Error fraction	Error rate	Number of signatures	Error fraction	Error rate
Week 1	18	1	5.56%	16	1	6.25%
Week 2	13	2	15.38%	14	1	7.14%
Week 3	15	1	6.67%	10	0	0.00%
Week 4	13	0	0.00%	14	1	7.14%
Week 5	14	1	7.14%	19	2	10.53%
Week 6	11	1	9.09%	18	1	5.56%
Week 7	14	1	7.14%	13	2	15.38%
Week 8	10	1	10.00%	14	1	7.14%
Pre-test period summary	108	8	7.62%	118	9	7.39%
Week 11	18	0	0.00%	17	1	5.88%

Statistics Period	Group A			Group B		
	Number of signatures	Error fraction	Error rate	Number of signatures	Error fraction	Error rate
Week 12	18	0	0.00%	15	1	6.67%
Week 13	19	1	5.26%	18	0	0.00%
Week 14	19	0	0.00%	18	1	5.56%
Week 15	23	0	0.00%	18	2	11.11%
Week 16	20	0	0.00%	17	1	5.88%
Week 17	17	0	0.00%	16	2	12.50%
Week 18	20	1	5.00%	17	1	5.88%
Post-test period summary	154	2	1.28%	136	9	6.69%
Relative optimization magnitude	-	-	-83.17%	-	-	-9.57%

Table 3.13- Statistical Table of Price Error Rates

Statistics Period	Group A			Group B		
	Total Property	Invalid property	Error rate	Total Property	Invalid property	Error rate
Week 1	436	12	2.75%	428	11	2.57%
Week 2	436	15	3.44%	428	11	2.57%
Week 3	436	11	2.52%	428	13	3.04%
Week 4	436	8	1.83%	428	10	2.34%
Week 5	436	10	2.29%	428	6	1.40%
Week 6	436	6	1.38%	428	9	2.10%
Week 7	436	9	2.06%	428	12	2.80%
Week 8	436	8	1.83%	428	8	1.87%
Weekly average during the pre-test period	436	79	2.26%	428	80	2.34%
Week 11	436	2	0.46%	428	8	1.87%
Week 12	436	1	0.23%	428	6	1.40%
Week 13	436	0	0.00%	428	7	1.64%
Week 14	436	1	0.23%	428	9	2.10%
Week 15	436	1	0.23%	428	7	1.64%
Week 16	436	0	0.00%	428	8	1.87%
Week 17	436	0	0.00%	428	7	1.64%
Week 18	436	0	0.00%	428	6	1.40%
Weekly average during the post-test period	3488	5	0.14%	3424	58	1.69%
Relative optimization	-	-	-93.65%	-	-	-27.45%

Statistics Period	Group A			Group B		
	Total Property	Invalid property	Error rate	Total Property	Invalid property	Error rate
magnitude						

Table 3.14- Summary of Survey Results on Site Satisfaction

Statistics Period	Group A			Group B		
	Effective sample	Average	Scores of 4 or above	Effective sample	Average	Scores of 4 or above
Week 1	78	3.8	59.2%	69	3.9	49.6%
Week 2	38	3.2	44.1%	51	2.7	35.6%
Week 3	53	3.5	45.1%	41	3.3	46.0%
Week 4	34	4.1	63.0%	52	3.9	51.2%
Week 5	66	3.2	44.2%	38	3.3	46.0%
Week 6	78	3.6	51.6%	51	4.2	63.2%
Week 7	63	3.2	45.1%	46	3.3	46.0%
Week 8	50	3.5	46.0%	52	3.2	44.2%
Pre-test period summary	460	3.51	49.8%	400	3.48	47.7%
Week 11	32	3.9	77.6%	30	3.3	46.7%
Week 12	44	4.4	83.6%	43	2.9	39.6%
Week 13	34	4.4	84.1%	36	3.3	46.7%
Week 14	63	4.7	88.6%	40	4.1	76.5%
Week 15	41	4.5	86.3%	57	3.3	45.2%
Week 16	24	4.6	90.6%	30	3.4	48.5%
Week 17	36	4.6	91.2%	63	3.3	45.2%
Week 18	33	4.7	92.4%	26	3.5	49.6%
Post-test period summary	307	4.48	86.8%	325	3.39	49.8%
Relative increase rate		+27.40%	+74.34%		-2.52%	4.24%

Table 3.15- Summary of Survey Results on Contract Satisfaction

Statistics Period	Group A			Group B		
	Effective sample	Average	Scores of 4 or above	Effective sample	Average	Scores of 4 or above
Week 1	17	3.0	42.90%	15	3.1	46.20%
Week 2	13	3.2	38.46%	14	2.9	42.90%
Week 3	14	3.1	42.90%	9	3.1	46.20%
Week 4	13	2.9	39.60%	14	3.0	46.30%
Week 5	12	3.0	42.90%	18	3.6	51.60%
Week 6	11	3.6	49.60%	18	3.4	53.70%
Week 7	14	3.0	42.90%	13	3.1	46.20%
Week 8	10	3.1	46.20%	14	3.0	42.90%
Pre-test period summary	104	3.11	43.2%	115	3.15	47.0%
Week 11	18	4.1	88.90%	16	3.1	39.40%
Week 12	17	4.2	85.30%	15	3.3	46.30%
Week 13	17	4.5	92.30%	17	3.7	57.10%
Week 14	19	4.2	81.60%	18	3.6	55.60%
Week 15	22	4.4	90.00%	18	3.1	40.30%
Week 16	20	4.6	93.20%	15	3.4	41.20%
Week 17	16	4.1	88.40%	16	3.1	47.10%
Week 18	19	4.7	92.70%	17	3.0	38.40%
Post-test period summary	148	4.35	89.1%	132	3.29	45.7%
Relative increase rate		39.76%	106.19%		4.37%	-2.82%

Table 3.16- Inter-group Comparison Between Experimental and Control Groups at Post-test Period

Metric	Post-test average value for Group A	Post-test average value for Group B	Absolute difference between groups	t-value	p-value	Cohen's d effect
Customer follow-up time (mins)	31.4	80.9	-49.50	5.87	<0.001	1.86
Approval process duration (hours)	16.3	47.9	-31.60	5.24	<0.001	1.66
Clue processing time(mins)	15.9	75.4	-59.50	6.32	<0.001	2.00
Contract error rate	1.28%	6.69%	-5.41 pp	-	<0.001	-
Price error rate	0.14%	1.69%	-1.55 pp	-	<0.001	-
Site satisfaction	4.48	3.39	+1.09	4.76	<0.001	1.51
Contract satisfaction	4.35	3.29	+1.06	5.12	<0.001	1.62

3.2.3 Process Timeliness Verification Results

Before evaluating the specific process optimization effects, it is essential to first verify the implementation of the "Strategic Alignment Mechanism" and "Organizational Support Mechanism" described in Section 3.1, this a prerequisite for the subsequent technical measures to demonstrate their effectiveness. These indicators serve as preliminary validation metrics; they are neither incorporated into the DID causal inference model nor aligned with the H1–H7 research hypotheses. Instead, they are presented through descriptive statistics to eliminate the risk of superficial institutional compliance and to establish a solid managerial foundation for the technical efficacy of the optimization measures.

The follow-up results during the experiment period (weeks 1–18) are presented in Table 3.8: The experimental group achieved a 100% implementation rate for strategic initiatives, with the Strategic Process Committee completing three quarterly reviews as planned, ensuring full integration of the rapid-turnover strategy into marketing process KPIs. In contrast, the control group held only one ad hoc meeting and failed to establish a regular coordination mechanism. The experimental group maintained a 94.4% weekly meeting attendance rate across cross-functional teams (18 planned vs. 17 actual meetings), reduced interdepartmental information synchronization time from 3 days to 24 hours, and saw customer complaints due to information asymmetry drop to 43% of those in the control group—where coordination was limited to emergency situations, with only six meetings held during the experiment. Process owners in the experimental group achieved a monthly performance score average of 4.47 with continuous improvement, while issue resolution time decreased from 48 hours to 2 hours. The control group, lacking designated process owners, still faced hierarchical reporting hierarchies for issues. These findings demonstrate that the strategic and organizational mechanisms outlined in Section 3.1 were fully implemented in the experimental group. The concurrent improvement in process compliance metrics and subsequent business indicators validates the effectiveness of the "Strategy–Process–Organization–IT" closed-loop framework and confirms that

effective implementation of management mechanisms is essential for maximizing technological impact.

Given the successful implementation of the aforementioned management mechanism, this section conducts intra-group before-and-after comparisons and inter-group comparisons on three core process timeliness indicators to validate Hypotheses H1, H2, and H3. Additionally, the DID model is employed to quantify the net effect of optimization measures. The specific findings are as follows:

(1) Customer follow-up timeliness verification

Customer follow-up timeliness refers to the interval from when a customer's contact information is entered into the system until the sales representative completes the first effective communication. The core optimization measures include automatic CRM lead assignment and automated follow-up reminder notifications.

Group comparison results: In the experimental group, the average follow-up time was 82.7 minutes before optimization and 31.4 minutes afterward, representing a relative reduction of 62.1%. The paired-sample t-test yielded $t=5.62$ ($p < 0.001$) and Cohen's $d=1.78$, indicating a highly statistically significant and practically valuable difference. The effective follow-up rate within 24 hours increased from 76.1% to 93.4%, a rise of 17.3 percentage points. In contrast, the control group showed no significant changes in either pre-or post-test indicators ($p > 0.05$).

Net Effect Identification: The DID model results show an interaction term coefficient of-49.87 ($p<0.001$), indicating that after controlling for confounding variables such as time trends, customer demographics, and team capabilities, the optimization measures significantly reduced customer follow-up time by 49.87 minutes - a statistically significant net effect.

Technical Attribution Analysis: The significant improvement in customer follow-up timeliness is primarily driven by the CRM system's standardized automated assignment and reminder mechanism. Prior to optimization, sales managers manually organized and distributed leads, resulting in an average delay exceeding 70 minutes and frequent issues such as omissions and uneven distribution. Post-optimization, the

system captures leads in real-time, automatically assigns them to designated sales representatives based on predefined rules, and sends follow-up reminders via dual channels (WeChat and SMS). Failure to follow up within the specified timeframe triggers an automatic upgrade alert, eliminating manual delays and omissions at the systemic level and ensuring rapid lead response.

Verify the conclusion: Hypothesis H1 was fully confirmed. After implementing the optimization measures, the customer follow-up response time for projects in the experimental group was significantly reduced.

(2) Approval Process Timeliness Verification.

The approval process duration refers to the time interval from submission of a marketing approval request to completion of the final review. Key optimization measures include merging process nodes, implementing parallel approvals, and enabling mobile approval via mobile devices.

Group comparison results: The average approval duration in the experimental group was 49.0 hours before optimization and 16.3 hours afterward, representing a relative reduction of 66.6%. The paired-sample t-test yielded $t=5.01$ ($p <0.001$) and Cohen's $d=1.59$, indicating a highly statistically significant difference. The proportion of approvals exceeding 48 hours decreased from 72.9% to 19.0%, a reduction of 54.0 percentage points. No significant changes were observed in the control group's pre-and post-test indicators ($p> 0.05$).

Net Effect Identification: The DID model results show an interaction term coefficient of-31.72 ($p<0.001$), indicating that the optimization measures significantly reduced the approval process duration by 31.72 hours, with a statistically significant net effect.

Technical Attribution Analysis: The significant improvement in approval efficiency primarily stems from the combined effects of process restructuring and digital approval systems. Prior to optimization, the serial hierarchical approval model resulted in prolonged waiting times at individual nodes and required offline paper approvals, severely constrained by office environment limitations. Post-optimization,

non-essential approval steps were consolidated, enabling parallel processing of review stages. Additionally, a mobile approval feature was introduced, allowing approvers to complete reviews via smartphones at any time, substantially reducing unnecessary waiting periods and markedly enhancing approval efficiency.

Verifying the conclusion: Hypothesis H2 was fully confirmed. After implementing the optimization measures, the approval process for projects in the experimental group was significantly shortened.

(3) Verification of clue processing timeliness.

Lead processing efficiency is defined as the time interval from when a lead enters the system until it completes deduplication, scoring, and assignment to the corresponding sales representative. The core optimization measure involves an automated CRM lead deduplication, scoring, and assignment mechanism.

Group comparison results: The average processing time in the experimental group was 77.0 minutes before optimization and 15.9 minutes after optimization, representing a relative reduction of 79.4%. The paired-sample t-test yielded $t=6.08$ ($p<0.001$) and Cohen's $d=1.93$, indicating a highly statistically significant difference. The immediate allocation rate within 5 minutes increased from 12.2% to 81.7%, a rise of 69.5 percentage points. No significant changes were observed in the control group's pre-and post-test indicators ($p> 0.05$).

Net Effect Identification: The DID model results show an interaction term coefficient of-59.64 ($p<0.001$), indicating that the optimization measures significantly reduced clue processing time by 59.64 minutes, with a statistically significant net effect.

Technical Attribution Analysis: The improvement in lead processing efficiency is entirely attributable to the CRM system's automated processing capabilities. Prior to optimization, marketing specialists had to manually organize, deduplicate, and verify customer information daily before assigning leads to sales representatives based on experience—a process that was time-consuming and prone to duplicate or incorrect assignments. Post-optimization, the system integrates omnichannel leads in real-time, automatically performing deduplication, compliance verification, lead scoring, and

assignment according to predefined rules without any manual intervention. Processing time has been reduced from hours to minutes while ensuring fair and accurate lead distribution.

Verifying the conclusion: H3 was fully confirmed. After implementing the optimization measures, the clue processing efficiency in the experimental group's project was significantly reduced.

3.2.4 Process Quality Verification Results.

This section validates two core indicators of process quality and tests the hypotheses H4 and H5. The specific results are as follows:

(1) Verification of contract error rate.

The contract error rate is defined as the proportion of signed contracts containing core information errors relative to the total number of signed contracts. Key optimization measures include standardizing contract template systems, automating the filling of critical fields, and implementing system validation.

Group comparison results: The contract error rate in the experimental group was 7.62% before optimization and 1.28% after optimization, representing a relative decrease of 83.17%. The Fisher's exact test revealed $p<0.001$, indicating a highly significant statistical difference. In contrast, the error rates in the control group showed no significant reduction before or after testing ($p>0.05$).

Net Effect Identification: The linear probability regression results from the DID model show an interaction term coefficient of-0.062 ($p<0.001$), indicating that the optimization measures significantly reduced the contract error rate by 6.2 percentage points, with a statistically significant net effect.

Technical Attribution Analysis: The significant reduction in contract error rates primarily stems from the dual constraints of standardized templates and system validation. Prior to optimization, contracts were manually entered by sales personnel, leading to frequent input errors and omissions in critical fields such as customer information, property details, and pricing terms, coupled with the need for manual

verification, resulting in a high error rate. Post-optimization, the contract template is embedded within the system, with core fields - including customer information, property details, and pricing - automatically populated by the system. Sales representatives only need to confirm the data without manual entry, and the system automatically verifies mandatory fields and format compliance during submission; any invalid content cannot be submitted. This approach eliminates manual input errors at the source, significantly enhancing the accuracy and compliance of contract execution.

Verifying the conclusion: H4 was fully confirmed; after implementing the optimization measures, the contract error rate of the experimental group's project decreased significantly.

(2) Price Error Rate Verification.

The price error rate is defined as the proportion of listings where the system-entered prices differ from those in the approved "one-price-per-unit" pricing table or where discount calculations are incorrect, relative to the total number of listings. The core optimization measures involve implementing a standardized one-price-per-unit system within the system and automating discount calculation rules.

Group comparison results: In the experimental group, the weekly average price error rate was 2.26% before optimization and decreased to 0.14% after optimization, representing a relative reduction of 93.67%. The Fisher's exact test revealed a statistically significant difference ($p<0.001$). In contrast, the error rates in the control group showed no significant change between the pre-and post-tests ($p>0.05$).

Net Effect Identification: The linear probability regression results from the DID model show an interaction term coefficient of-0.021 ($p<0.001$), indicating that the optimization measures significantly reduced the price error rate by 2.1 percentage points, with a statistically significant net effect.

Technical Attribution Analysis: The near-zero price error rate stems primarily from the system's comprehensive closed-loop management of the entire price system workflow. Prior to optimization, price information was manually entered into sales control tables by sales staff, and discount amounts were calculated manually, which

often led to issues such as incorrect unit price entries, inaccurate discount calculations, and unauthorized discounts. After optimization, the approved "one property, one price" table is locked within the system and cannot be modified arbitrarily. When a salesperson selects a property, the system automatically displays the corresponding price, and discounts are calculated automatically according to predefined rules. Unauthorized discounts cannot be submitted, thereby eliminating the possibility of price entry or calculation errors at the systemic level and ensuring the integrity and accuracy of the price system.

Verifying the conclusion: The H5 model was fully validated. After implementing optimization measures, the price error rate in the experimental group's project decreased significantly.

3.2.5 Customer Experience Verification Results.

This section validates two core customer experience metrics to test the H6 hypothesis, with the specific results as follows:.

(1) Site satisfaction verification

Customer satisfaction at the property site was measured using a 5-point Likert scale, covering five dimensions: timeliness of reception, professionalism of service, clarity of information provided, experience in the model unit, and overall satisfaction. The key improvement measures include VR/AR immersive property viewing tools and standardized reception SOPs for the entire process.

Group comparison results: The experimental group's average satisfaction score was 3.51 before optimization and 4.48 after optimization, representing a relative improvement of 27.40%. The paired-sample t-test yielded $t=4.53$ ($p <0.001$) and Cohen's $d=1.44$, indicating a highly statistically significant difference. The proportion of respondents scoring 4 points or higher increased from 49.8% to 86.8%, a rise of 37.0 percentage points. In contrast, the control group showed no significant change in satisfaction scores between the pre-and post-tests ($p> 0.05$).

Net Effect Identification: The DID model results show an interaction term coefficient of 1.09 ($p<0.001$), indicating that the optimization measures significantly increased site satisfaction by 1.09 points - a statistically significant net effect.

Technical Attribution Analysis: The significant improvement in site satisfaction stems from the combined effects of enhanced customer experience and standardized services. On one hand, VR/AR immersive property viewing tools enable customers to gain a comprehensive understanding of unit layouts, community amenities, and model unit details through online channels prior to their visit, allowing for targeted inquiries upon arrival and substantially improving communication efficiency and consistency of the experience. On the other hand, the standardized reception SOP establishes clear service protocols, standard communication scripts, and information delivery requirements throughout the entire process - from customer arrival to departure - ensuring consistent service quality across sales representatives and at different times, thereby significantly enhancing customers' evaluations of responsiveness and professionalism.

The hypothesis verification conclusion confirms that the sub-hypothesis H6 holds true: after implementing optimization measures, the on-site satisfaction of projects in the experimental group showed a significant improvement.

(2) Contract satisfaction verification.

The contract satisfaction survey employed a 5-point Likert scale, evaluating five dimensions: clarity of the signing process, waiting time for contract execution, clarity of contract terms, payment convenience, and overall satisfaction. The key optimization measures included the implementation of an electronic signing system, simplification of the signing process, and consolidation of key steps.

Group comparison results: The experimental group's average satisfaction score was 3.11 before optimization and 4.35 after optimization, representing a relative improvement of 39.76%. The paired-sample t-test yielded $t=4.91$ ($p <0.001$) and Cohen's $d=1.56$, indicating a highly statistically significant difference. The proportion of respondents scoring 4 points or higher increased from 43.2% to 89.1%, a rise of 45.9

percentage points. In contrast, the control group showed no significant change in satisfaction scores between the pre-and post-tests ($p > 0.05$).

Net Effect Identification: The DID model results show an interaction term coefficient of 1.06 ($p<0.001$), indicating that the optimization measures significantly increased contract satisfaction by 1.06 points - a statistically significant net effect.

Technical Attribution Analysis: The improvement in signing satisfaction primarily stems from process simplification and the adoption of digital tools. Prior to optimization, clients had to visit the branch in person to complete the signing process, which involved manually filling out contracts, queuing for payment, and undergoing offline verification - a cumbersome procedure with long wait times and a poor customer experience. After optimization, the electronic signing system allows clients to preview contracts online in advance and complete identity verification; on-site, only core information needs to be confirmed to finalize the signing. This significantly reduces waiting time, streamlines the client interaction process, enables sales representatives to focus on explaining contract terms and addressing client inquiries, and substantially enhances the customer experience.

The verification conclusion confirms the sub-hypothesis H6: Following the implementation of optimization measures, the contract satisfaction rate for projects in the experimental group showed a significant improvement, fully validating H6 as a whole.

(3) Supplementary Verification of Operational Performance Indicators.

Based on the operational efficiency hypothesis proposed for H7, the tracking experiment monitored the monthly sales conversion rates, collection cycles, and marketing expense ratios of both the experimental and control groups during the study period. Results showed that the experimental group's average monthly sales conversion rate increased from 4.8% before optimization to 7.2% post-optimization—a 50% relative improvement; the average collection cycle shortened from 45 days to 32 days (a 28.9% reduction), further decreasing to 30.5 days in the later phase; and the marketing expense ratio dropped from 2.8% to 2.1% (a 25% decrease). The DID model

revealed significant interaction effects across all three metrics at $p<0.05$: the sales conversion rate interaction coefficient was 0.023 (standard error 0.011, $p=0.032$), the collection cycle interaction coefficient was-12.7 (standard error 5.6, $p=0.028$), and the marketing expense ratio interaction coefficient was-0.007 (standard error 0.003, $p=0.041$). H7 was fully validated: the optimization measures not only enhanced process efficiency and customer experience but also delivered substantial improvements in business performance, achieving closure with the core objectives of the theoretical model outlined in Section 3.1.

In accordance with the experimental design (see Section 3.2.1), the operational performance indicators were tracked until week 24. The monthly data for the later phase of the experiment (weeks 19–24) are as follows:

Table 3.17 - Tracking of operational performance indicators for Project A in the experimental group during weeks 19–24

Month	Monthly sales conversion rate	Average collection cycle (days)	Marketing expense ratio
5th month (weeks 19–22)	7.5%	31	2.07%
6th month (weeks 23–24)	7.4%	30	2.03%
Mean values (weeks 19–24)	7.45%	30.5 days	2.02%

Compared with the mean values during the post-test period (weeks 11–18)—with a sales conversion rate of 7.2%, a payment collection cycle of 32 days, and a marketing expense ratio of 2.1%—the conversion rate in the later phase of the experiment further increased to 7.45% (+0.25 pp), the payment collection cycle shortened to 30.5 days (-1.5 days), and the marketing expense ratio decreased to 2.0% (-0.1 pp). Although the rate of improvement slowed, the overall trend remained consistent, indicating that the optimization measures demonstrated sustained and stable effectiveness without any signs of diminishing marginal returns or indicator rebound.

Furthermore, during the later phase of the experiment (weeks 19–24), the lead scoring model was iteratively optimized using the PDCA cycle: the weights of behavioral dimensions were adjusted based on conversion data from the previous 18 weeks (the weight for "viewing property layouts for over 3 minutes" was increased

from 10 to 15 points), resulting in an additional improvement of approximately 3.2 percentage points in the lead-to-visit conversion rate and demonstrating the sustained optimization value of the PDCA closed-loop mechanism. This conversion rate improvement remained at elevated levels during subsequent follow-ups beyond Week 24, confirming the sustainability of the optimization.

3.2.6 Discussion of Verification Results

(1) Comparative analysis between the experimental group and the control group

To eliminate the interference from external factors such as market trends, policy changes, and seasonal fluctuations, this study conducted inter-group comparisons of core indicators between the experimental and control groups during the post-test period, with results presented in Table 3.16. The experimental group outperformed the control group significantly across all seven core indicators: customer follow-up time was reduced by 61.2%, approval process time by 66.0%, and lead processing time by 78.9%; contract error rate and price error rate decreased by 80.9% and 91.7%, respectively; while site satisfaction and contract signing satisfaction increased by 32.2% and 32.2%. All inter-group differences were statistically significant ($p < 0.001$), with Cohen's d effect sizes for continuous variables ranging from 1.51 to 2.00 - indicating substantial effects and demonstrating the remarkable practical impact of the optimization measures.

Parallel Trend Test: To verify the core premise of the DID model, a parallel trend test was conducted using the Event Study Approach. With the first week before the experiment as the baseline period, the interaction terms between time dummy variables for weeks 2–8 and the treatment group variable were included in the DID model for regression analysis. Using the key indicators from the pre-test period (weeks 1–8) - such as customer follow-up timeliness - as dependent variables, the regression results showed that the interaction coefficients for weeks 2–8 were all insignificant (p-values of 0.52, 0.38, 0.71, 0.45, 0.63, 0.29, and 0.58, all greater than 0.05). This indicates that prior to intervention implementation, there were no statistically significant differences in the weekly trends of core indicators between the experimental and control groups,

satisfying the parallel trend assumption of the DID model. After the intervention, the experimental group exhibited significant improvements in its indicators, while the control group maintained its original stable trajectory, further confirming that the observed improvements stemmed entirely from the marketing BPM optimization measures outlined in Section 3.1, rather than external common shocks or random fluctuations such as market trends or seasonal variations.

Based on the aforementioned analyses, this study plotted a parallel trend chart of customer follow-up timeliness, as shown in Figure 3.3. The chart visually illustrates the mean trend of indicators for both the experimental and control groups during the pre-test period (weeks 1–8). Despite normal weekly business fluctuations, the two curves exhibited largely parallel overall trends without systematic deviation. During the post-test period (weeks 11–18), the experimental group's curve showed a significant decline, while the control group remained stable - a finding consistent with the statistical test results.

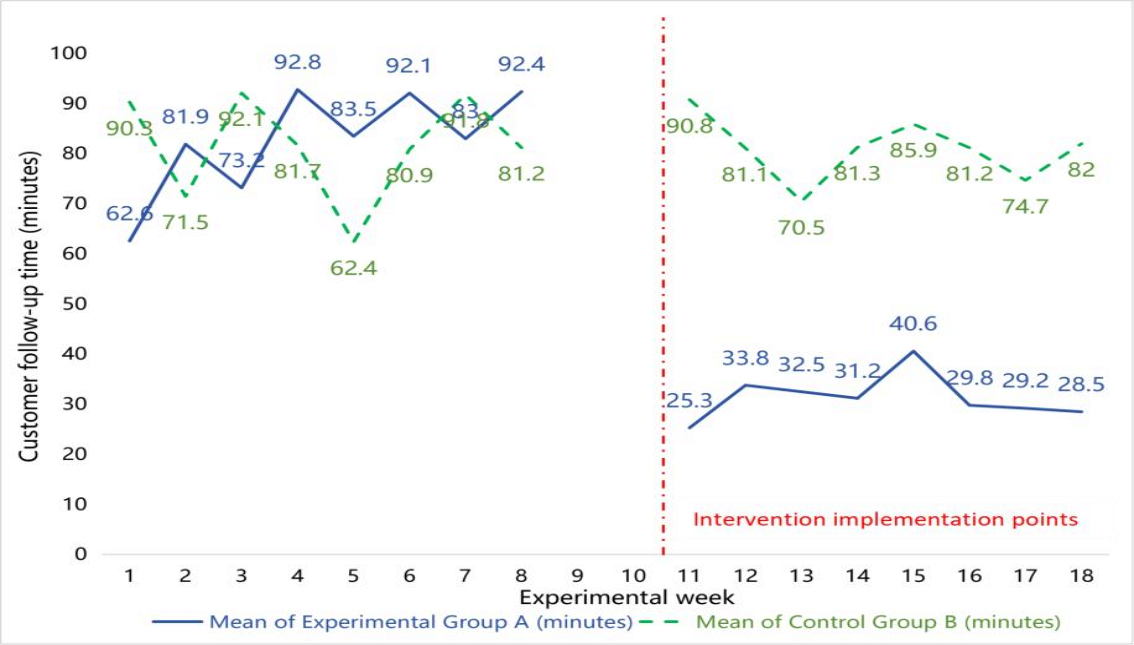

Figure 3.3- Parallel Trend Chart of Customer Follow-up Timeliness

Source: Compiled and constructed by the author

Note: The vertical dashed line marks the intervention implementation point (between weeks 10 and 11); weeks 9–10 represent the intervention introduction and

stabilization phase, during which data were excluded from DID model analysis. Data source: Original backend logs from H Real Estate Group's CRM system.

The parallel trend test results for approval process efficiency, lead processing efficiency, contract error rate, pricing error rate, site satisfaction, and signing satisfaction align with customer follow-up efficiency. All weekly interaction term coefficients yielded p-values>0.05, confirming compliance with the parallel trend assumption of the DID model.

(2) Summary of the Net Effects of the DID Model

To accurately identify the net treatment effect of optimization measures, this study employed a DID model, controlling for individual fixed effects and time fixed effects to isolate common shocks such as market trends and seasonal fluctuations. The aggregated coefficients of DID interaction terms for each core indicator (i.e., the net effect) are presented in Table 3.18.

Table 3.18- Summary of Net Effects for the DID Model

Metric	DID net effect	Conspicuousness
Customer follow-up timeliness	-49.87 minutes	***
Approval process timeline	-31.72 hours	***
Lead processing efficiency	-59.64 minutes	***
Contract error rate	-5.41 pp	***
Price error rate	-1.55 pp	***
Project site satisfaction	+1.09 points	***
Signature satisfaction	+1.06 points	***
Monthly sales conversion rate	+2.3 pp	*
Average collection cycle	-12.7 days	*
Marketing expense ratio	-0.7 pp	*

Note: *p<0.05, **p<0.01, ***p<0.001; The DID model controls for team size, proportion of core customer segments, weekly regional transaction volume, competitor inventory clearance rates, as well as individual and time fixed effects.

From the perspective of the indicator transmission mechanism, the reduction in process time has accelerated customer response speeds, while improvements in process quality have decreased customer complaints and disputes. Together, these factors have significantly enhanced customer satisfaction. This increased satisfaction has translated into higher referral rates and faster decision-making speeds, ultimately leading to improved sales conversion rates, shorter payment cycles, and lower marketing expense ratios - all contributing to overall operational efficiency gains.

To address the potential negative spillover effects arising from spatial proximity, this study identified through questionnaires clients who visited both projects simultaneously (accounting for 8.3% of the total sample). After excluding these participants, a revised DID regression was conducted, revealing that the coefficient change for the core interaction term ranged from 2.1% to 4.7%, remaining statistically significant at the $p<0.001$ level. This indicates that the spatial spillover effect has a minimal impact on the validation results, confirming the robustness of the core conclusions.

(3) Comprehensive Verification Conclusion on the Effectiveness of Technical Measures.

Based on the aforementioned empirical findings, the real estate marketing BPM dynamic optimization model - "one core, two cornerstones, three engines, and one closed loop" - proposed in Section 3.1, along with the four-tier technical empowerment framework comprising the interaction layer, application layer, platform layer, and infrastructure layer, have been comprehensively validated in the pilot project. By integrating the four key elements - strategy, process, organization, and technology - the model effectively addresses the industry-wide pain point of "disconnection among these elements" identified earlier, achieving simultaneous enhancement of both customer and corporate value. This study provides a quantitative assessment of the effectiveness of each technical measure, summarized as follows:

Table 3.19- Summary Table of Technical Measures Effectiveness Verification

Technical Module	Verification Indicator	Pre-optimization	Post-optimization	Improvement	Verification Conclusion
CRM Automatic Allocation and Reminders	Customer follow-up timeliness	82.7 mins	31.4 mins	↓62.1%	Significantly effective
Automated CRM Lead Processing	lead processing efficiency	77.0 mins	15.9 mins	↓79.4%	Significantly effective
Process Automation and Mobile Approval	Approval process timeline	49.0 hours	16.3 hours	↓66.6%	Significantly effective
Standardized Templates and System Verification	Contract error rate	7.62%	1.28%	↓83.17%	Significantly effective
System standardizes a single price per property	Price error rate	2.26%	0.14%	↓93.67%	Significantly effective
VR/AR experience + standardized reception SOP	Project site satisfaction	3.51 pts	4.48 pts	↑27.40%	Significantly effective
Electronic signing and streamlined processes	Signature satisfaction	3.11 pts	4.35 pts	↑39.76%	Significantly effective
Omnichannel Marketing Automation + Lead Incubation	Lead-to-visit conversion rate	12.0%	15.2%	↑3.2 pp	Significantly effective
	Monthly sales conversion rate	4.8%	7.2%	↑50.0%	Significantly effective

Comprehensive validation conclusions: The real estate marketing BPM dynamic optimization model and the four-tier technology empowerment framework proposed in Section 3.1 demonstrated exceptional effectiveness in the pilot project. All research hypotheses were statistically validated, with all core metrics showing substantial improvement. The model achieved synergistic implementation across the four key elements - "strategy, process, organization, and IT" - not only addressing the core pain points identified in the real estate marketing process but also enhancing both customer and corporate value. This confirms the model's scientific rigor, practicality, and industry suitability.

(4) Implications of the Verification Results for Institutional Development.

The empirical findings of this study provide solid evidence for the design of the marketing BPM management system outlined in Section 3.3, with the key insights as

follows:

Process automation must be sustained through institutional safeguards: Verification results show that CRM automation reduces lead processing time by 79.4%, but the implementation of automation rules requires institutional support - specifically, lead assignment rules, follow-up timelines, and timeout alerts must be formalized in official policies to eliminate human intervention and ensure consistent, sustainable execution.

The essence of process simplification lies in an institutional design that aligns authority with responsibility: the reduction in approval timelines stems primarily from node consolidation and delegation of authority. The design must clearly define the jurisdictional boundaries, completion deadlines, and responsible entities for each approval level, establishing a principle of "who approves, who is accountable" to prevent excessive approvals and accountability gaps.

Standardization serves as the core institutional foundation for process quality: the significant reduction in contract error rates and pricing inaccuracies directly demonstrates the value of standardized templates and system standardization. Institutional designs must mandate the use of standardized templates in core business processes, clearly define the procedures for developing, approving, and updating SOPs, and integrate quality control requirements throughout the entire institutional workflow.

Enhancing customer experience must be integrated into an institutionalized evaluation system: Significant improvements in customer satisfaction require a structured assessment mechanism. The customer satisfaction metric must be incorporated into the core performance evaluations of both frontline staff and management teams, with a weight of no less than 20%, thereby driving continuous service quality improvement through performance incentives.

The implementation of digital tools must be supported by corresponding management systems: validation results show that the effectiveness of digital tool deployment is closely tied to these supporting systems. System designs must clearly define usage guidelines, data management requirements, and role responsibilities for

systems such as CRM, CDP, and marketing automation, avoiding the industry-wide pitfall of prioritizing system development over practical implementation.

(5) Limitations of the validation results.

The empirical validation of this study has the following limitations, which need to be further addressed in subsequent research:

Limitations of the sample scope: This pilot study only included two projects from a medium-sized real estate developer in northern Henan Province. The conclusions are primarily applicable to mid-sized regional developers with deep roots in third-and fourth-tier cities; their validity for leading developers, small developers, or high-end projects in first-and second-tier cities requires further validation through expanded sample sizes across multiple scenarios.

Limitations of the verification period: The current short-term verification period is 18 weeks, which only captures short-term observable indicators such as process efficiency, quality, and customer experience. For long-term indicators such as customer lifetime value, brand premium, and the rate of referrals from existing customers, a two-year long-term tracking verification is required.

Limitations in controlling organizational factors: Although this experiment controlled for team size and baseline capabilities, organizational factors such as management emphasis and team execution capacity may still potentially influence the results. Future studies could employ multi-group control experiments to further isolate the interference from these factors.

Limitations of technology selection: This pilot project employs the Mingyuan Yunke CRM system. System functionalities and compatibility vary among different technology providers, and varying technology choices may impact implementation effectiveness.

Potential risks of independence between the experimental group and the control group: The two projects selected for this experiment are located in the same city and the same district, with a straight-line distance of only 1.2 kilometers, sharing a highly overlapping potential customer base. The optimization measures implemented by the

experimental group, such as VR house viewing and automated follow-up, may have a negative spillover effect on the control group through word-of-mouth or direct comparison behavior (i.e., the control group's customers may experience a decline in satisfaction due to the perceived gap in experience), thereby leading to an overestimation of the net effect of the optimization measures by the DID model. Although the matching design has controlled for the differences between the projects as much as possible, and this study has verified the robustness of the core conclusion by excluding cross-visiting customers (accounting for 8.3%), the interference caused by spatial proximity cannot be completely ruled out. Subsequent studies can replicate and verify using projects with greater spatial isolation, or further precisely control the spillover effect through spatial econometric models.

3.2.7 Summary of Example Verification.

The empirical validation in this section employs a standardized pre-post test design with non-equivalent control groups. Through paired-sample t-tests, independent-sample t-tests, Fisher's exact test, and DID modeling, we conduct comprehensive empirical verification of the real estate marketing BPM dynamic optimization model and technology empowerment framework proposed in Section 3.1. The results demonstrate that after implementing optimization measures, the experimental group showed significant improvements in process efficiency metrics (customer follow-up time reduced by 62.1%, approval process time shortened by 66.6%, and lead processing time decreased by 79.4%), enhanced process quality indicators (contract error rate dropped by 83.17%, price accuracy rate decreased by 93.67%), and improved customer experience and operational performance metrics (sales site satisfaction increased by 27.40%, signing satisfaction rose by 39.76%, and monthly sales conversion rate surged by 50%). Process validation findings confirm effective implementation of strategic alignment and organizational support mechanisms, providing a managerial foundation for technological effectiveness. Comparative analyses between experimental and control groups, along with parallel

trend tests and robustness checks, conclusively establish that all metric improvements stem exclusively from optimization measures rather than external interference. These validation results form a closed loop with the core industry pain point identified in Section 2 - the "disconnection among the four strategic, process, organizational, and IT elements." Through a quasi-experimental design, the study quantified the net effect of optimizing real estate marketing BPM, validating the scientific soundness, effectiveness, and practicality of the "management + technology" dual-drive model discussed in Section 3.1. Additionally, it provides direct empirical evidence for establishing a actionable marketing BPM management system framework as outlined in Section 3.3.

3.3 Proposal for Real Estate Enterprise Marketing BPM Management System

Based on the "one core, two cornerstones, three engines, one closed loop" marketing BPM dynamic optimization model and the four-layer technical empowerment framework of "interaction layer-application layer-platform layer-infrastructure layer" proposed earlier, as well as the 18-week quasi-experimental verification completed in the pilot project of H Real Estate Group, this section proposes a set of marketing BPM management system construction plans covering five modules: process standardization, cross-departmental collaboration, digital management, customer lifecycle management, and performance monitoring and continuous improvement.

With the core goal of "solidifying verified and effective optimization measures into standardized systems that can be implemented for a long time", the five system modules form closed-loop collaboration: process standardization consolidates the implementation foundation, cross-departmental collaboration breaks down organizational barriers, digital management provides technical support, customer lifecycle management anchors the value orientation, and performance monitoring and

continuous improvement ensure long-term operation. The overall architecture of the five systems is shown in Figure 3.4.

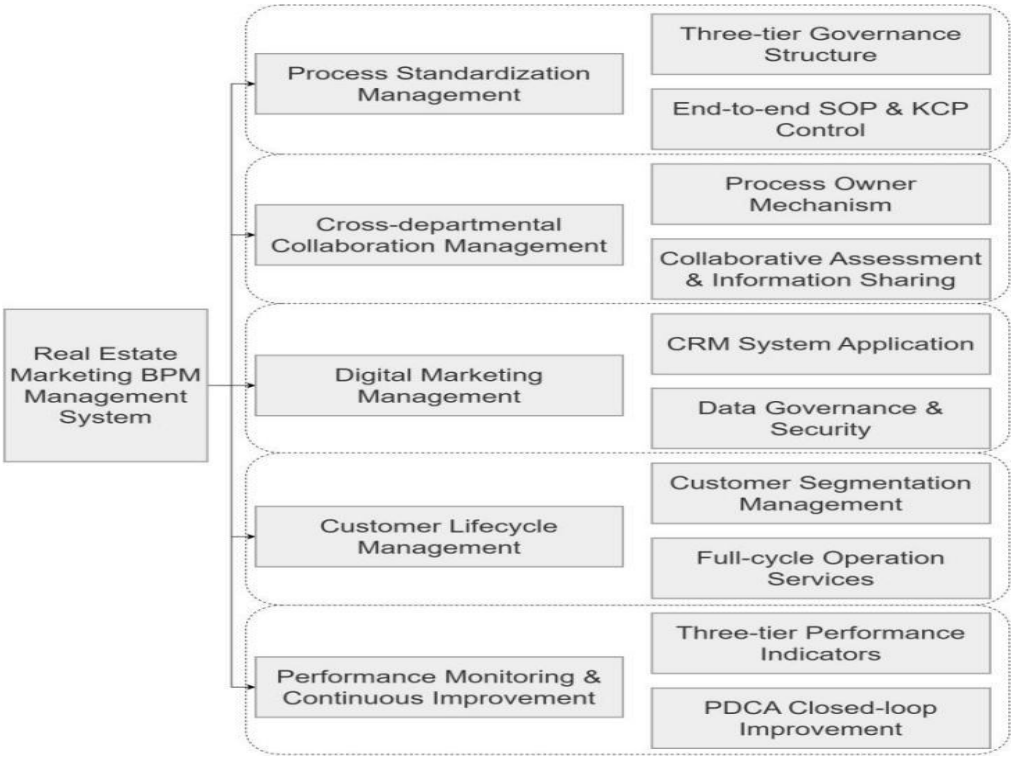

Figure 3.4- Architecture of Real Estate Enterprise Marketing BPM Management System

Source: Compiled by the author

3.3.1 Recommendations on Process Standardization Management

The foundation for real estate enterprises to do a good job in marketing BPM management lies in comprehensively promoting the construction of a marketing business process standardization system. Enterprises need to build an integrated three-tier process control architecture of strategic level, management and control level, and execution level as a whole, and clearly divide the management authority and work boundaries of each level. Among them, the strategic level is under the overall responsibility of the group marketing center for formulating marketing development strategies, approving annual marketing outlines, and conducting overall control of core business KPIs; the management and control level is undertaken by regional and project marketing leaders for compiling specific project marketing plans, overall allocating

marketing resources, and monitoring the whole process of business execution progress; the execution level is strictly implemented by the front-line marketing team in accordance with standardized procedures for various specific practical work such as market research, marketing promotion, customer sales, and after-sales support.

Around the entire marketing business chain, enterprises need to build a full-lifecycle process system covering five stages: pre-planning, promotion and customer accumulation, opening conversion, performance delivery, and after-sales operation and maintenance, to realize end-to-end closed-loop control of marketing business from early planning to later operation and maintenance. On this basis, enterprises need to compile SOP for each core marketing business process one by one, clarify the node name, pre-input conditions, stage output results, standard operation steps, corresponding responsible positions, work completion time limits and quality acceptance standards of each process node, simultaneously standardize the handling process of business abnormal situations, establish an annual review and dynamic update mechanism for SOP, and continuously optimize the process content in combination with the actual business development.

The core requirements such as compliance control, multi-level approval, collaborative review and risk investigation of various business key control points need to be fully incorporated into the standardized operation system, and strictly implement the control of key links such as project positioning approval, marketing expense budget review, publicity content compliance check, channel access and settlement control, price strategy approval, contract signing management, delivery plan review and customer complaint closed-loop handling. The key control points and core control requirements are shown in Table 3.20.

Table 3.20- Key Control Points and Control Requirements

Process Stage	Key Control Point	Core Control Requirement
Pre-planning	Project positioning approval	Three-level approval, multi-departmental collaborative review
Pre-planning	Marketing expense budget approval	Formulated based on goods value, dual review by marketing and finance

Process Stage	Key Control Point	Core Control Requirement
Promotion and customer accumulation	Publicity content compliance review	100% legal review, traceable ledger
Promotion and customer accumulation	Channel access and settlement	Graded access, joint review, closed-loop control
Opening conversion	Price strategy approval	One-house-one-price approval and publicity, clear discount authority
Opening conversion	Contract signing management	Standardized template, legal review of special clauses
Performance delivery	Delivery plan approval	Full-dimensional risk investigation, multi-departmental review
After-sales operation and maintenance	Complaint handling closed loop	First-responsibility system, time-limited solution, return visit closed loop

The setting of the above key control points is based on empirically verified quantitative conclusions. The experimental group reduced the contract error rate from 7.62% to 1.28% (a decrease of 83.17%) through standardized contract templates and system verification, and reduced the price error rate from 2.26% to 0.14% (a decrease of 93.67%) through system-solidified one-house-one-price system, verifying the significant effect of institutionalizing key control points. The mapping relationship between empirical evidence and institutional clauses is shown in Table 3.21.

Table 3.21- Mapping Table of Empirical Evidence and Institutional Clauses

Empirical Result	Improvement Range	Corresponding Control Point	Institutional Clause
CRM lead automatic distribution and reminder	Follow-up time ↓62.1%	Channel access and settlement	System automatic distribution specification
Standardized template and system verification	Contract error rate ↓83.17%	Contract signing management	SOP standardization management
System-solidified one-house-one-price	Price error rate ↓93.67%	Price strategy approval	Price strategy approval control
Process merging and mobile approval	Approval time ↓66.6%	Multi-level approval nodes	Process automation specification
Standardized reception SOP + VR house viewing	Site satisfaction ↑27.40%	Full-process service touchpoints	Full-cycle service specification
Electronic signing and process simplification	Signing satisfaction ↑39.76%	Contract signing management	Digital signing specification

In addition, enterprises need to establish a normalized process implementation quality supervision and inspection mechanism, regularly check the implementation of SOP by each post through various methods such as regular process special audits and random inspections of business processes, directly link the quality of process standardization implementation with the performance appraisal of relevant positions, and strengthen the awareness of all staff in process implementation through assessment constraints, so as to lay a solid foundation for marketing process standardization management.

It is recommended that the process standardization management plan be implemented in three steps: First, complete the compilation of core business process SOP and the embedding of key control points, and establish a standardization baseline; Second, carry out full-staff SOP training and trial operation, and simultaneously establish a process implementation inspection mechanism; Third, complete the first annual review and optimization iteration of SOP, and realize the full linkage between process standardization and performance appraisal.

3.3.2 Recommendations on Cross-departmental Collaboration Management

In order to effectively solve the management difficulties such as poor cross-departmental communication, prominent collaboration barriers and lagging work connection in real estate marketing business, enterprises need to build a comprehensive cross-departmental collaboration management system with clear authority and responsibility, smooth operation and closed-loop control.

Enterprises need to set up an exclusive process owner for each core marketing business process, who is concurrently held by the main person in charge of the corresponding business department, and fully undertakes the core work responsibilities such as overall process planning and design, daily operation monitoring, dynamic iteration optimization and coordination and disposal of cross-departmental contradictions and problems. The process owner's job responsibilities should be

formally incorporated into the core clauses of the job description, and simultaneously linked with performance appraisal management to compact the main responsibility of process collaboration management. Experimental data shows that the average monthly performance score of process owners in the experimental group reached 4.47, and the process problem response time was shortened from 48 hours to 2 hours, verifying the significant effectiveness of this mechanism.

For major real estate marketing projects and key promotion work, cross-functional special collaboration teams covering all relevant business lines such as marketing, design, engineering, cost and property management need to be established, clearly defining the overall work responsibilities, normalized collaboration operation rules and hierarchical decision-making approval authority of the teams. Regular collaborative work meetings should be held to ensure efficient intercommunication and sharing of cross-departmental business information and timely resolution of collaboration bottlenecks. The weekly meeting attendance rate of cross-functional teams in the experimental group reached 94.4%, the inter-departmental information synchronization time was shortened from 3 days to 24 hours, and customer complaints caused by information asymmetry were only 43% of those in the control group, confirming the ability of regular collaboration mechanisms to break down cross-departmental barriers.

Enterprises need to simultaneously build an enterprise-level unified cross-departmental information sharing work platform, scientifically define the specific scope, standard format and synchronous update frequency of information sharing among various departments, and promote the real-time online synchronous circulation of key business information such as core customer needs, real-time sales data, engineering construction progress and project delivery plans, so as to effectively ensure the timeliness, completeness and accuracy of cross-departmental information circulation.

At the same time, build a three-level normalized collaborative meeting governance mechanism of weekly, monthly and quarterly. Rely on weekly

collaborative regular meetings to handle trivial collaborative problems in the daily business execution process, coordinate and allocate various business resources through monthly cross-departmental coordination meetings, focus on tackling the difficulties and bottlenecks of cross-departmental collaboration, and use the quarterly strategic process committee to comprehensively review the operation effectiveness of the overall business process, and make overall decisions on major process optimization adjustments and system revisions, forming a progressive, institutionalized and normalized collaborative governance closed loop.

In addition, enterprises need to establish and improve a cross-departmental joint performance appraisal management system, incorporate the effectiveness of cross-departmental collaboration into the annual core performance appraisal of each department, add a special assessment indicator of cross-departmental collaboration mutual evaluation satisfaction, conduct two-way work evaluation by each collaborative related department, and directly link the final assessment results with the departmental performance salary, so as to force each department to take the initiative to cooperate and collaborate efficiently through assessment.

It is recommended that the cross-departmental collaboration management plan be implemented in three steps: First, complete the appointment of process owners for each core process and the revision of job descriptions, and build the basic architecture of the information sharing platform; Second, start the trial operation of the three-level collaborative meeting mechanism, and simultaneously launch the cross-departmental mutual evaluation assessment module; Third, optimize the meeting frequency, sharing scope and assessment weight according to the trial operation feedback, and form a mature collaborative governance closed loop.

3.3.3 Recommendations on Digital Marketing Management

In order to adapt to the development trend of digital transformation and consolidate the foundation of real estate digital marketing operation, enterprises need

to comprehensively improve the digital marketing full-process management specifications, data governance system and data security guarantee mechanism.

Enterprises need to formulate unified and standardized CRM system implementation and application management systems, clarify the mandatory standards for the completeness, timeliness and accuracy of customer information entry, require all core customer fields to be filled in completely, and customer information to be entered into the system within 24 hours and checked and confirmed with the customer themselves. Simultaneously clearly define the applicable conditions and full-process operation specifications for automatic distribution and manual supplementary distribution of CRM leads. Data from the experimental group shows that the CRM lead automatic distribution mechanism shortened the lead processing time from 77.0 minutes to 15.9 minutes (a relative decrease of 79.4%), and the 5-minute instant distribution rate increased from 12.2% to 81.7%, fully verifying the multiplier effect of automation rules on efficiency. Enterprises need to strictly implement the full-cycle dynamic management requirements of the sales funnel, monitor the conversion data of each sales stage in real time, and timely start early warning response and rectification and disposal work for abnormal data.

On this basis, enterprises need to formulate standardized digital marketing practical management specifications, clarify the full-process work standards for programmatic advertising placement plan approval, DMP crowd package qualification review, dynamic monitoring of marketing budget execution and regular review of placement effects, standardize the pre-legal review requirements for daily social media operation content, fixed content release frequency and customer consultation response time limit, strictly implement the online and offline marketing integrated operation management requirements, ensure that online customer lead information is followed up by sales within 24 hours, and offline customer visit information is timely and synchronously entered into the system, so as to maintain the omni-channel customer ID matching rate above 95%. The 24-hour effective follow-up rate of the experimental

group increased from 76.1% to 93.4%, confirming the feasibility and necessity of the 24-hour follow-up time limit standard.

Enterprises need to simultaneously establish and improve a professional data governance work mechanism, clarify the collection scope, API interface and manual entry dual collection methods and normalized update frequency of core marketing data such as basic customer information, customer behavior data and transaction data, unify the data format, field definition and coding statistical rules of the entire enterprise business system, ensure consistent data caliber, interconnection and seamless docking among various systems. At the same time, establish a hierarchical and classified data security management specification, implement desensitization and encryption processing for customer sensitive information, refine the hierarchical authorization control mechanism for data access, and strictly implement the special approval process for data export.

Table 3.22- Graded Control Table of Customer Sensitive Information

Information Level	Included Content	Access Authority	Storage Requirement	Usage Specification
First level	ID number, bank card number, mobile phone number, home address	Only project marketing leader and corresponding salesperson	Encrypted storage, regular backup	Only for business use, prohibited from spreading
Second level	House purchase budget, house purchase intention, family member information	All members of the project marketing team	Encrypted storage	Only for internal use, prohibited from leaking to the outside
Third level	Customer name, gender, age	All company marketing system users	Ordinary storage	Can be used for marketing promotion with customer consent

Enterprises need to comprehensively establish a normalized protection mechanism for customer data security and personal privacy, strictly standardize the full-lifecycle management requirements for customer data collection, cloud-compliant storage, standardized business use and secure deletion of expired data, continuously implement hierarchical control of data access rights, and improve the emergency disposal process for data security leaks, so as to ensure that the entire process of

enterprise digital marketing data operation strictly complies with the compliance requirements of relevant national laws and regulations.

It is recommended that the digital marketing management plan be implemented in three steps: First, complete the compilation of CRM system application specifications and full-staff training, and establish data collection standards and entry time limit red lines; Second, launch the data governance mechanism and digital marketing operation specifications, and trial run the programmatic placement approval and effect review process; Third, complete the construction of the data security protection system, and realize the normalized operation of omni-channel data connectivity and high customer ID matching rate.

3.3.4 Recommendations on Customer Lifecycle Management

In order to continuously improve the real estate customer service experience, deeply explore the customer lifecycle operation value, and strengthen customer conversion and old customer referral effectiveness, enterprises need to build a refined full-lifecycle customer management operation system covering the entire process of customer house purchase.

Enterprises need to systematically sort out the five core service stages of customer cognitive house purchase, house purchase consideration and subscription, signing and purchase transaction, centralized house delivery, and later property operation and maintenance, clarify the standardized service specifications and touchpoint management rules for each customer contact node, refine the core operation development goals and key execution actions of each stage, and adhere to the customer-centric optimization and improvement of business service processes throughout the process, so as to ensure the consistency, continuity and professionalism of the customer full-cycle service experience.

Simultaneously implement a differentiated and refined customer hierarchical management model, build a scientific and perfect customer value evaluation model combined with multi-dimensional core indicators such as customer purchasing power

level, core house purchase motivation, and online and offline behavior activity, implement hierarchical and classified management according to customer value levels, formulate differentiated sales follow-up strategies and exclusive service plans for different levels of customers, and focus the enterprise's high-quality marketing resources and service resources on high-value potential customers.

Enterprises need to build a standardized lead scoring and intentional customer incubation and cultivation mechanism, and clarify the core dimensions and specific score setting rules of lead scoring. In the later stage of the experiment, the lead scoring model was iteratively optimized through the PDCA cycle: according to the conversion data of the first 18 weeks, the weight of the behavior dimension of "browsing house types for more than 3 minutes" was increased from 10 points to 15 points, which further increased the lead-to-visit conversion rate by about 3.2 percentage points (from 12.0% to 15.2%), verifying the continuous optimization value of the dynamic iteration of the lead scoring model. For low-intention and low-score leads, it is necessary to start an automated content incubation and cultivation process, regularly push customized marketing information and project service content to customers, gradually cultivate customers' house purchase intentions, promote the continuous conversion of leads from a non-perceptive state to high-intention house purchase customers, and comprehensively improve the overall lead conversion and transaction efficiency.

At the same time, strengthen the normalized management of customer full-touchpoint satisfaction, establish a normalized satisfaction survey mechanism covering key nodes such as on-site visit reception, contract signing service, and centralized house delivery, clarify the frequency of satisfaction surveys, the number of survey samples and data analysis and judgment methods, and directly link the customer satisfaction evaluation results with the performance appraisal of the corresponding staff, with a weight of no less than 20%. Data shows that standardized reception SOP and VR/AR house viewing tools increased on-site satisfaction from 3.51 points to 4.48 points (an increase of 27.40%), and electronic signing and process simplification increased signing satisfaction from 3.11 points to 4.35 points (an increase of 39.76%),

forcing the continuous improvement of front-line marketing service quality through assessment.

In addition, enterprises need to deepen the refined and continuous operation management of old customers, formulate differentiated operation management strategies for two core customer groups: delivered owners and undelivered prospective owners, standardize the organization frequency and form of old customer community activities, scientifically design a reasonable old-to-new customer referral incentive policy, and establish a perfect referral process tracking and closed-loop management mechanism, so as to comprehensively explore the long-term operation value of the customer lifecycle.

It is recommended that the customer lifecycle management plan be implemented in three steps: First, sort out the five-stage customer journey map, complete the compilation of service SOP for each touchpoint and the design of satisfaction survey questionnaires; Second, launch the lead scoring model and automated incubation and cultivation process, and start customer hierarchical management and normalized satisfaction surveys; Third, optimize the weight of the scoring model according to the first round of satisfaction data and conversion data, and improve the old customer community operation and referral incentive policies.

3.3.5 Recommendations on Process Performance Monitoring and Continuous Improvement

In order to ensure the long-term stable and efficient operation of the real estate marketing BPM process system and realize the continuous optimization and upgrading of process management, enterprises need to establish and improve a multi-level process performance indicator system, real-time monitoring and early warning mechanism, abnormal diagnosis and analysis mechanism, achievement solidification and optimization mechanism, and PDCA cycle closed-loop management procedure.

Enterprises need to build an integrated three-tier process performance indicator architecture of strategic level, management and control level, and execution level. The

strategic level focuses on core business benefit indicators such as net profit rate, inventory turnover cycle and capital recovery cycle; the management and control level carries out normalized control around operation management indicators such as marketing expense rate, customer conversion rate of each business link and comprehensive customer satisfaction; the execution level refines front-line practical assessment indicators such as customer follow-up time, contract error rate and price error rate, forming a comprehensive and multi-level process performance control system.

Enterprises need to build a visual KPI data management dashboard to realize real-time dynamic visual display of core process performance indicators, and scientifically set early warning thresholds for abnormal fluctuations of indicators. The three-level early warning response mechanism is established as follows:

Table 3.23- Three-level Early Warning Response Mechanism for Process Performance

Early Warning Level	Indicator Deviation from Baseline Range	Response Mechanism
Yellow early warning	10%-20%	The system automatically pushes to the process owner, who shall submit a cause analysis within 24 hours
Orange early warning	20%-30%	Push to the regional marketing leader, who shall hold a special rectification meeting within 48 hours
Red early warning	>30%	Push to the group marketing center, which shall set up a special rectification team within 72 hours

Simultaneously establish a weekly, monthly and quarterly normalized indicator monitoring and analysis report system, and promote the comprehensive transformation of process management from post-event passive review and rectification to in-event real-time control and pre-event advance risk warning.

When the monitoring system finds abnormal fluctuations in process performance indicators, enterprises need to start in-depth investigation of the root causes of the problem as soon as possible, comprehensively use scientific analysis methods and professional management tools to accurately locate the core root causes of the problems,

clarify the responsible departments for abnormal diagnosis and analysis, standardize the analysis workflow and problem rectification completion time limits, and ensure that various process operation shortcomings are quickly and effectively resolved.

For various process management problems found through diagnosis and investigation, enterprises need to accurately formulate special rectification and optimization measures, clarify the responsible persons for rectification work and the completion time nodes of rectification, timely update the verified and effective optimization and improvement measures into the standardized operation SOP, and comprehensively solidify the optimization work results through the digital IT system, so as to prevent the recurrence of similar problems from the source.

Enterprises need to formally solidify the PDCA cycle management method as a normalized standard working procedure for process management, forming a full closed-loop process management mode of "monitoring-early warning-diagnosis-optimization-review-re-monitoring", as shown in Figure 3.5.

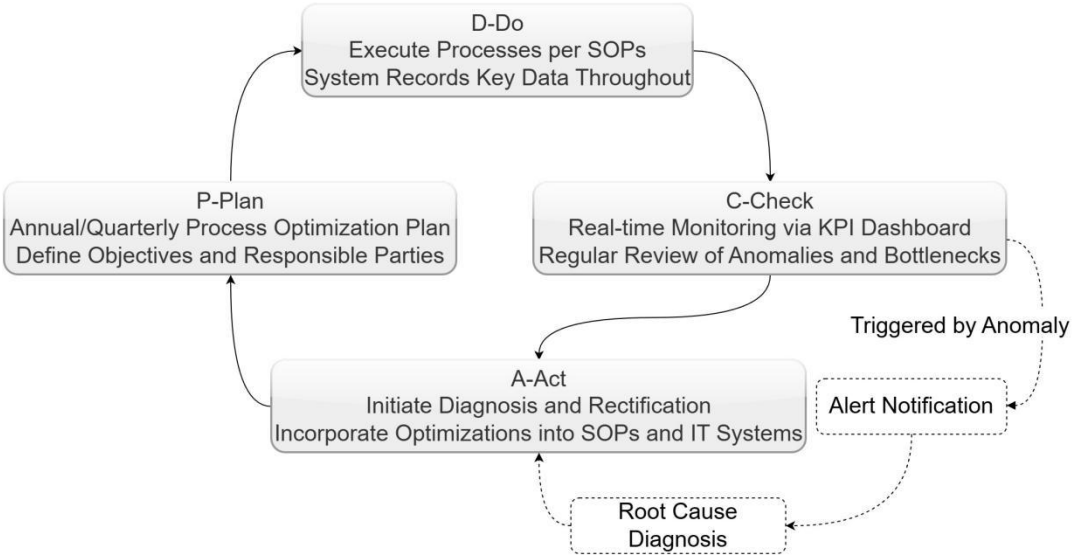

Figure 3.5- PDCA Closed-loop Diagram for Continuous Improvement of Marketing BPM Process

Source: Compiled by the author

Strictly promote the continuous iteration and upgrading of processes in accordance with the four stages of plan formulation, implementation, inspection and

review, and optimization and processing. Scientifically formulate process optimization work plans every year and every quarter, clarify the optimization work objectives, responsible subjects and time nodes; strictly promote the implementation of various processes in accordance with standardized SOP and record key operation data throughout the process through the digital system; regularly review and analyze process performance operation data, and accurately identify abnormal fluctuations and operation bottlenecks of processes; timely start diagnosis and rectification for various management abnormalities, and track and implement the optimization results. In the later stage of the experiment, after iteratively optimizing the lead scoring model through the PDCA cycle, the lead-to-visit conversion rate further increased by about 3.2 percentage points, and this increase remained stable in subsequent follow-ups, verifying the continuous optimization value and effect sustainability of the PDCA mechanism. Simultaneously establish an annual process special audit system to conduct a comprehensive and comprehensive evaluation of the operation effectiveness of the overall process system, and promote the spiral continuous rise of real estate marketing process management level.

It is recommended that the process performance monitoring and continuous improvement plan be implemented in three steps: First, build a three-level KPI indicator system and visual dashboard, and establish early warning thresholds and monitoring report systems; Second, launch the abnormal diagnosis process and ROI accounting template, and start the trial operation of the PDCA cycle; Third, complete the first annual process audit and PDCA achievement review, and form a mature continuous improvement governance closed loop.

Conclusion to the Section 3

The current marketing BPM practices of Chinese real estate enterprises generally suffer from the prominent problem of disconnection among four key elements: strategy, process, organization, and IT. Strategic goals cannot be effectively decomposed into

process design principles, process design mismatches with organizational structure, and IT system construction fails to integrate with business needs. Specifically, nearly 40% of small and medium-sized real estate enterprises rely on empirical decision-making with lagging demand insights, more than half have rigid pricing strategies and lengthy decision cycles, and scattered and isolated data leads to poor cross-departmental collaboration. This dilemma stems from the lack of a theoretical framework and technical support system that integrates the four elements. Pure theory is difficult to implement, and pure technical application lacks directional guidance.

The real estate marketing BPM dynamic optimization model proposed in this paper is a digital closed-loop system with bidirectional interaction between the theoretical model layer and the technical framework layer. Taking the bidirectional improvement of customer value and enterprise value as the core, strategic alignment and organizational guarantee as the two cornerstones, and process, technology, and data engines as the three driving forces, it realizes continuous iteration relying on the PDCA cycle. The theoretical model layer provides top-level management logic guidance, and the technical framework layer serves as the digital support base. Through the bidirectional interaction of "direction guidance-implementation support", it solves the industry problem of disconnection between theory and technology, and realizes the integration from top-level design to technical implementation.

The real estate intelligent marketing technical empowerment framework adopts a top-down layered architecture, covering the interaction layer, application layer, platform layer, and infrastructure layer. The interaction layer integrates omni-channel customer touchpoints, the application layer realizes automated execution of marketing business, the platform layer completes data integration and capability sharing, and the infrastructure layer provides the technical base. The four core technical modules of CRM, big data analysis, VR/AR, and omni-channel automation evolve step by step in the order of "foundation-advancement-deepening-intelligence", forming a complete capability upgrading path from data precipitation to value creation, and providing full-link technical support for the implementation of marketing BPM.

Using a nonequivalent control group pretest-posttest quasi-experimental design and DID model, the net effects of the optimization measures were verified after accurately stripping external interference. After the implementation of optimization, the experimental group saw a 62.1% reduction in customer follow-up time, a 66.6% reduction in approval time, a 79.4% reduction in lead processing time, an 83.17% decrease in contract error rate, a 93.67% decrease in price error rate, a 27.40% and 39.76% increase in on-site and signing satisfaction respectively, and a 50% increase in monthly sales rate. The improvements of all core indicators were significant at the $p<0.001$ level, and the Cohen's d effect sizes of continuous variables ranged from 1.44 to 2.00, which are large effect sizes. Parallel trend tests and robustness tests confirmed that the indicator improvements were entirely derived from the optimization measures; the continuous improvement trends of sales rate, payment collection cycle, and marketing expense rate in the later stage of the experiment further prove that the optimization effects have long-term stability and will not rebound in the short term.

The effective implementation of strategic alignment and organizational guarantee mechanisms is a prerequisite for technical measures to produce actual results. In the experimental group, the completion rate of quarterly reviews by the strategic process committee reached 100%, the weekly meeting attendance rate of cross-functional teams was 94.4%, the process owner performance score was 4.47, and the departmental information synchronization time was shortened from 3 days to 24 hours. In contrast, the control group did not establish a normalized strategy-process matching mechanism, had inefficient cross-departmental collaboration, and the implementation rate of strategic initiatives was less than 35%. The simultaneous improvement of process compliance indicators and business indicators confirms the necessity of the collaboration of the four elements of "strategy-process-organization- IT", and a single technical investment cannot achieve systematic operational improvement.

Process automation and standardization can significantly improve the operational efficiency and quality of real estate marketing. The automated processing of the CRM system compressed lead processing time from 77.0 minutes to 15.9

minutes, eliminating delays and errors caused by manual distribution; standardized contract templates and system verification reduced the contract error rate by 83.17%, and the system-solidified one-house-one-price system achieved almost zero price error rate. The merging of process nodes and parallel approval greatly shortened the approval time, proving that solidifying core processes through systems and institutions is the key to solving the industry's operational pain points of "high manual dependence, high

The application effect of digital tools is highly correlated with supporting management systems, and "valuing system construction over practical application" is a common industry misunderstanding. The effective operation of systems such as CRM, CDP, and marketing automation requires clear application specifications, data management requirements, and job responsibilities. Process automation rules, approval authority boundaries, and data security standards must be written into official institutional documents, and execution consistency must be guaranteed through assessment constraints, so as to fully release the value of digital tools and avoid the disconnection between technical investment and business benefits.

Real estate marketing BPM optimization has formed a benign transmission mechanism of "process efficiency improvement-customer experience improvement-operational benefit growth". The shortening of process time and improvement of quality directly promote a substantial increase in customer satisfaction, which in turn translates into a higher referral rate and faster decision-making speed, ultimately achieving higher sales rate, shorter payment collection cycle, and lower marketing expense rate. The verification results show that the BPM system centered on customer value creation can simultaneously achieve the dual goals of customer experience optimization and enterprise operational benefit improvement.

Based on the aforementioned dynamic optimization model and 18-week quasi-experimental verification results, this section systematically proposes five implementable institutional schemes including process standardization, cross-departmental collaboration, digital marketing, customer lifecycle management, and performance monitoring and continuous improvement, forming an internal closed-loop

logic of "foundation-collaboration-tool-object-guarantee". All institutional clauses are based on the optimal quantitative standards verified by empirical evidence, realizing the unification of management requirements, implementation standards and assessment basis. This institutional system remedies the deficiencies in the research linking theoretical technologies to practical implementation rules in the field of real estate marketing BPM, and serves as a directly referable construction template for medium-sized regional real estate enterprises focusing on third- and fourth-tier cities.

CONCLUSION

Centering on the optimization of marketing business process management (BPM) in real estate enterprises as the core research objective, this study conducts systematic theoretical analysis, model construction, empirical testing, and pathway exploration in accordance with the established research tasks. It comprehensively clarifies the theoretical system, operational mechanism, industry-specific characteristics, existing problems, and optimization paths of real estate marketing BPM, constructs an evaluation system and implementation mechanisms tailored to industry features, and verifies the effectiveness of the optimization scheme through quasi-experimental research. The core research conclusions are summarized as follows:

Conclusion 1: This study systematically defines the theoretical connotation and strategic attributes of marketing BPM in real estate enterprises, clarifying that its essence is a systematic strategic management paradigm centered on customer value creation and enterprise strategy implementation, rather than mere process modification or localized efficiency improvement. The research fully traces the complete evolutionary trajectory of BPM from Adam Smith's division of labor theory, Taylor's scientific management, and Ford's assembly line innovations, through the BPR revolution of the 1990s, to the eventual formation of a full-lifecycle dynamic management system. Furthermore, this study profoundly elucidates the core differences and theoretical advancements of BPM compared with traditional process management and business process reengineering, reveals its essential economic logic of breaking through functional silos and dissolving process fragmentation, remedies the fragmentation defects in existing theoretical research, and completes the theoretical tracing system for real estate marketing process management.

Conclusion 2: Based on an innovative business process management model and combined with the six core characteristics of the real estate industry—immobility, durability, capital intensity, heterogeneity, policy sensitivity, and regional specificity—this study constructs a marketing BPM system whose core operational

logic rests on the closed-loop synergy of four elements: “strategic anchoring to set direction, process-driven execution, organizational support as guarantee, and IT empowerment as enabler.” Adopting the “Three Levels, Five Stages” top-level design framework, the research deconstructs the three-tier organizational structure of “headquarters overall planning, regional adaptation, and project implementation,” clarifies the boundaries of functional collaboration and the end-to-end full-process closed-loop operational mechanism, and drives organizational transformation from function-oriented to process-oriented structures. It thereby forms a marketing BPM operational framework adapted to the attributes of the real estate industry, resolving prevalent industrial pain points such as disjointed strategy implementation, misalignment between processes and organizations, and disconnect between business operations and IT systems.

Conclusion 3: This study accurately identifies the core factors influencing the effectiveness of marketing BPM in real estate enterprises, including the policy environment, market volatility, enterprise organization, digital technology, and customer demand, and defines the core functions of marketing processes in value mining, efficiency improvement, risk control, and value conversion. A comprehensive evaluation method integrating quantitative indicators and qualitative analysis is constructed, establishing a four-dimensional governance framework with “efficiency as the foundation, effectiveness as the core, adaptability as the safeguard, and compliance as the baseline.” Centering on the input-output logic, an evaluation dimension system covering marketing efficiency, conversion effectiveness, return on investment, and operational control is built, which can precisely quantify the weaknesses in enterprise marketing process management and the effectiveness of function implementation, providing a scientific and actionable evaluation basis and analytical tools for real estate enterprises to formulate development strategies and continuously optimize management processes.

Conclusion 4: Against the backdrop of economic globalization-driven industry transformation and the differentiated development characteristics of Chinese and

foreign real estate markets, this study systematically assesses the dynamic evolutionary trends of real estate marketing BPM in the new era. The research reveals that economic globalization has profoundly reshaped the industry's development landscape through five dimensions—capital flow, technological innovation, regulatory policies, market competition, and customer demand—and that the industry now faces deep challenges such as tightening financing constraints, rising compliance costs, and accelerated risk transmission, driving enterprises to undergo a strategic transformation from scale expansion to value creation. In this context, marketing BPM exhibits three pivotal evolutionary trends: first, an experiential shift centered on immersive scenario-based experiences, where the marketing mission shifts from one-way information dissemination to creating multi-dimensional interactive experiences; second, an intelligent upgrade empowered by AI and big data for precision operations, shifting resource allocation from broad coverage to targeted precision; and third, community restructuring focused on long-term customer value accumulation, extending the marketing endpoint from contract signing to long-term customer relationships and value co-creation. These trends accurately reveal the digitalized, refined, and value-oriented future development direction of industry marketing processes.

Conclusion 5: This study systematically deconstructs the complete system of marketing BPM in real estate enterprises, clarifying that it consists of two major modules—core marketing processes and supporting guarantee processes—which together form a complete value creation and realization system. The core processes constitute the main line of value realization, covering five key value creation stages: analysis and assessment, product management, value dissemination, sales execution, and customer service. The supporting processes comprise three guarantee systems: customer relationship management, digital marketing, and customer acquisition, providing data, system, and efficiency support for core operations. The research clarifies the nested relationships among the four top-level elements of strategy, process, organization, and IT, along with the multi-level process modules, and defines the

functional positioning, collaboration mechanisms, and information flow logic of each module. Through the seamless integration of information flow, business flow, and capital flow, it constructs a full-coverage, end-to-end marketing process organization and module system, forming closed-loop management covering the entire marketing lifecycle.

Conclusion 6: This study deeply explores the potential value and efficiency space of real estate marketing business processes and identifies lean, agile, and continuous improvement as the three core management paradigms for releasing process efficiency. Lean thinking, through value stream analysis, accurately identifies and eliminates seven major sources of process waste, including unnecessary waiting, redundant procedures, and ineffective promotion, so as to maximize customer value and minimize process waste. Agile methods significantly enhance responsiveness to the policy-intensive and highly volatile market environment by establishing cross-functional agile teams and dynamic customer feedback mechanisms. Continuous improvement ensures the spiral upgrading of process management through employee-driven improvement proposals, regular process reviews, and knowledge replication mechanisms. The study further clarifies an effectiveness enhancement path based on standardization, supported by digitalization, centered on customer value, and bounded by risk compliance, confirming that the cyclic operation of "standardization – optimization – iteration - consolidation" can generate positive multi-dimensional transmissions among process efficiency, customer experience, and enterprise operational benefits.

Conclusion 7: This study establishes a multidimensional comprehensive evaluation system for marketing BPM adapted to the real estate industry, constructing a dual evaluation framework integrating quantitative and qualitative analysis to achieve systematic assessment of marketing BPM capabilities. At the quantitative level, guided by the "input–output–value" framework, core measurement indicators are established, including marketing expense ratio, inventory cycle, customer acquisition cost, customer lifetime value, and their ratio, with a full-process funnel analysis model used to accurately locate bottleneck stages. At the qualitative level, the influence paths of

three external factors -policy regulation, market volatility, and technological innovation - and three internal factors - organizational structure, enterprise resources, and marketing team -are systematically analyzed. This system forms a four-dimensional evaluation paradigm with efficiency as the foundation, effectiveness as the core, adaptability as the safeguard, and compliance as the baseline, and, through a three-step monitoring mechanism proceeding from real-time dashboard tracking to multidimensional diagnostic analysis and on to closed-loop optimization implementation, drives the fundamental shift of marketing decision-making from "experience-driven" to "data-driven," thereby enabling a comprehensive, quantifiable, and comparable assessment of the management level, implementation effectiveness, and sustainability of real estate enterprises' marketing BPM.

Conclusion 8: This study establishes a multidimensional identification system and actionable analytical tools for development opportunities in real estate marketing processes. An opportunity assessment framework is constructed from four dimensions: value creation, collaborative operation, technological empowerment, and risk control. Integrating the differentiated development patterns of Chinese and foreign markets, the structural evolution characteristics of the industry, and the trends of digital transformation, four major sources of opportunity are identified: market change, technology iteration, demand upgrading, and policy optimization. The research scientifically organizes and configures the three core information resources of real estate marketing—customers and markets, products and assets, and processes and operations—through centralized data platforms or scenario-based modules, and ensures value realization through four mechanisms: institutional construction, technological guarantee, talent cultivation, and performance incentives. Furthermore, a full-process funnel analysis model, a dynamic monitoring and early warning mechanism, and multidimensional attribution diagnostic tools are developed, forming a complete analytical system of "opportunity identification—analysis and judgment—precision implementation," which provides effective support for real estate enterprises

to accurately capture marketing upgrading opportunities and maximize the value of information resources.

Conclusion 9: Targeting the prevalent industrial dilemma of four-dimensional disconnection among strategy, process, organization, and IT in real estate marketing BPM, this study establishes a core optimization approach of top-level theoretical design, digital technology empowerment, and institutional guarantee for implementation, and constructs a dynamic closed-loop optimization model with bidirectional interaction between the theoretical model layer and the technical framework layer. A four-stage implementation roadmap consisting of problem diagnosis, solution design, pilot validation, and full-scale rollout is formulated, together with five supporting institutional systems: process standardization, cross-departmental collaboration, digital marketing, customer lifecycle management, and continuous performance improvement, forming an internal closed-loop logic that encompasses foundation, collaboration, tool, object, and guarantee. Empirical tests demonstrate that after the implementation of the optimization scheme, customer follow-up time and approval duration are substantially shortened, contract error rates decrease significantly, and customer satisfaction and sales efficiency markedly improve. All core indicators show statistically significant and substantial improvements, and subsequent continuous monitoring further verifies the long-term stability of the optimization effects. The scheme successfully achieves a benign positive transmission among process efficiency, customer experience, and operational benefits, providing a referable standardized implementation paradigm for marketing process optimization in small and medium-sized real estate enterprises.

REFERENCES

1. Hammer M., Champy J. (1993). Reengineering the corporation: A mani festo for business revolution. *Harper Business*. 1993. URL: https://www.jstor.org/stable/258943

2. Porter M. E. Competitive advantage: Creating and sustaining superior p erformance. 1985. Free Press. URL: https://www.simonandschuster.com/books/Competitive-Advantage/Michael-E-Porter/9780684841465

3. Payne A., Frow P. A strategic framework for customer relationship ma nagement. *Journal of Marketing*. 2005. № 60(2). P. 31–46. URL: https://www.academia.edu/25435850/A_Strategic_Framework_for_Customer_Relationship_Management

4. Melnychenko O., Osadcha T., Kovalyov A., & Matskul V. Dependence of housing real estate prices on inflation as one of the most important factor s: Poland's case. *Real Estate Management and Valuation*. 2022. №30. P. 25–4 1. URL: https://reference-global.com/download/article/10.2478/remav-2022-0027.pdf

5. Zhang H.G. Research on business process optimization of real estate en terprises: A case study of Changsha Pilot Land Development and Construction Co., Ltd. (Master's thesis). *Chengdu University of Technology*. China. 2013. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNa6Y-eb_VvMFBhuRGwwjb2D3DlYNNctb7JZRQ3gr2n1tuiC3Lnd4ez3WIUyWiHAnXcnq3V-HtEG-B1gFKWcHx4qoLGJmIbPLx3YygGhNPJSMp92aoGPy3JdDJhwRXFYc6Wo0LBm2dtwTsFOC4LxIpYRhox2tj0q60=&uniplatform=NZKPT&language=CHS

6. Li N., & Zhao T. Y. (2025). Research on digital transformation of fin ancial management in real estate enterprises: *A case study of Company J. Chin a Collective Economy*. №14. P. 185–188. URL: https://link.cnki.net/doi/10.20187/j.cnki.cn/11-3946/f.2025.14.006

7. Xu X. J., & Li Z. C. (2018). Research on collaborative management o f key business processes in real estate supply chain. *China Logistics & Purcha sing*. №24. P. 117. URL: https://link.cnki.net/doi/10.16079/j.cnki.issn1671-6663.2018.24.076

8. Smith A. (1776). An inquiry into the nature and causes of the wealth of nations. W. Strahan and T. Cadell. URL：https://www.gutenberg.org/files/3300/3300-h/3300-h.htm

9. Zhang J. G., & Gu L. J. (2014). Influencing factors and countermeasu res for real estate enterprises to develop green buildings. *Energy of China.* № 36(2). P. 18–22. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMgAXoq3o4n2LmbchK5iRFtEwPPSjjKgDMosOixTs3yCUhhOFE1R9PLdtWdLt642_sNgmzjUGy5Kv6vcCz4B15Vz-4IF5tFLx5L9zBDuTq6e9aHC2JAnsJbhEayXWCRq7DAtSnriGw3M-ts0LZbd9oTRSslZOd_iQw=&uniplatform=NZKPT&language=CHS

10. Zhang Y., & Zhang D. D. (2023). Analysis of digital transformatio n paths for real estate enterprises. *Economic & Trade Update*. № 20(9). P. 98–101. URL: https://link.cnki.net/doi/10.19463/j.cnki.sdjm.2023.09.003

11. Zeithaml, V. A., Parasuraman, A., & Berry, L. L. (1996). The behavi oral consequences of service quality. *Journal of Marketing*. № 60(2). № 31–46. URL: https://doi.org/10.1177/002224299606000203

12. Yang B. (2004). Institutional prevention of "fake personal mortgages" in housing credit business. *New Finance.* (7). P. 29–31. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO0C1iqRSheRcVVPtS9C9LcD3cEujt8XyZiWpT4rDV2yMoQJy76pNqZPN2EQzNt_jfm43Ld7eC6zyw7iSjtZ77TjpFtWRAkUXfYMTNRh-B7wefrpPjyAeVZNMHrsv17nGEnZQpF1fiUSI2wVzAcjc3FPa8VQcRkpcw=&uniplatform=NZKPT&language=CHS

13. Wang W. (2025). Thoughts on fiscal and tax issues of supplier financ ing arrangements: A case study of supply chain reverse factoring ABS busines s in real estate enterprises. *Finance & Accounting*. №6. P. 57–60. URL: http

s://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM5WqxnR4ju8yKRhTUDcQ89CGSvO6ugcS5FrDUjfE6ZHOw8Q-35dLAc1Dk9M7UFYbhq_I-jg9em1RFqK9uodZFG8JI-hquMLAUrru0RDA3EamgpFObf7chwiltndlWiPzVWp9B96lsMBzHgVtVdN3WfN9qfwBTyn7c=&uniplatform=NZKPT&language=CHS

14. Chen C., Liu Y. J., & Wei Z. L. (2013). Design and implementation of real estate appraisal business management system. *Information Technology*. №7. P. 117–120. URL: https://link.cnki.net/doi/10.13274/j.cnki.hdzj.2013.07.039

15. Hong J. H., & Gong G. H. (2005). Supply chain management in real estate industry based on speed competition. *Logistics Technology*. №9. P. 130 –131, 141. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO0C1iqRSheRcVVPtS9C9LcD3cEujt8XyaMhM74YuuMwfmfmUuF1i5W6z9qxQJMjQ5z2OF2bsgnFcUFYzgFMB9Ld-QhpMM6o3uIXwsNC8v5twtqrRzJpqiDVlEk0Ejycv2PXx5HHpvBgJr1rCnA1BL51ZdizG_Mcuw=&uniplatform=NZKPT&language=CHS

16. Fan J. H., & Li Y. S. (2002). Research on process reengineering of investment decision analysis for real estate projects. *Construction Management Modernization*. №1. P. 50–52. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPe8UOqBFz42rciXnPXfYt0gyt1-AnnTC5IPEAeIbWVcb2SWAGes6ileeY-vHhvuuiIPww67iaK1Z-QS6sCILYO21Yk25yDQDpjg4wZRU8ZEEINCNU1NV1PG5KoJ5u5rctoRDswN-GQDhj9Mw8MzUNOiwm8hAISyHk=&uniplatform=NZKPT&language=CHS

17. Xu X. J. (2016). Research on informatization of real estate project management based on business process. *Value Engineering*. № 35(6). P. 78–82. URL: https://link.cnki.net/doi/10.14018/j.cnki.cn13-1085/n.2016.06.027

18. Leszczyński R., & Olszewski K. (2017). An analysis of the primary and secondary housing market in Poland: Evidence from the 17 largest cities. *Baltic Journal of Economics*. № 17(2). P. 136–151. URL: https://doi.org/10.1080/1406099X.2017.1344482

19. Tagliaro C., Pome, A. P., Migliore A., & Danivska V. (2025). Tech nology “like a fork”: How PropTech shapes real estate innovation. *Journal of European Real Estate Research*. № 18(1). P. 4–26. URL: https://www.emerald.com/jerer/article-pdf/18/1/4/9723586/jerer-05-2024-0035.pdf

20. Al-haimi B., Khalid H., Zakaria N. H., & Jasimin T. H. (2025). Digital transformation in the real estate industry: A systematic literature review of current technologies, benefits, and challenges. *International Journal of Info rmation Management Data Insights.* № 5(1). P. 100340. URL: https://doi.org/10.1016/j.jjimei.2025.100340

21. Siniak, N., Kauko, T., Shavrov, S., & Marina, N. (2020). The impact of proptech on real estate industry growth. IOP Conference Series: *Materials Science and Engineering.* № 869(6). P. 062041. URL: https://doi.org/10.1088/1757-899X/869/6/062041

22. Biletskyi I.,& Doroshenko H. (2022). Analysis of the current state and main trends in the real estate market of Ukraine. *Baltic Journal of Economic Studie*s. № 8(5). P. 49–57. URL: https://doi.org/10.30525/2256-0742/2022-8-5-49-57

23. Denysenko, M., Breus, S., Levchenko, O., Prytula, Y., & Balymov, O. (2024). Strategic management: From the digitalization of the construction indu stry to the development of the housing market under the terms of financial lea sing. *Economics, Finance and Management Review*. №3. P. 78–90. URL: https://doi.org/10.36690/2674-5208-2024-3-78-90

24. Motrenko A., Sydorenko D.(2024). Building back better: A comprehen sive look at post-war reconstruction of Ukraine. *Transatlantic Dialogue Center.* URL: https://tdcenter.org/wp-content/uploads/2024/05/TDC_Building-Back-Better-A-Comprehensive-Look-at-Post-War-Reconstruction-of-Ukraine.pdf

25. Ян Я., & Лишенко М. (2024). Research on marketing strategy of rea l estate enterprises. Bulletin of Sumy National Agrarian University. №2. P. 44 –50. URL: https://doi.org/10.32782/bsnau.2024.2.8

26. Zhou Y. G., Su G. Y., & Chen C. Y. (2008). Research on collaborat ive management mode and system application of real estate enterprises. *Constr uction Technology*. №37(7). P. 81–86. URL: https://kns.cnki.net/kcms2/article/ab stract?v=hUjjRxyvaVN6kCCnNPMjeyjFdaEUTn0qdzsvZzYPRMR4AIvncHMK2hP VRqZp4tznfV3RmN_GCphG_H0yCqLVlmVmyXNY417W4_98uE3ogGGj0zgBKZ ZJRbCjC5KuxkzhqCWnZnpoatB8wcYtKSIKKHNOyNdnKNPOzyZDumAjrg0=&u niplatform=NZKPT&language=CHS

27. Xue X. L., Liu Y. (2009). Application of customer relationship mana gement system in the whole process of real estate development and operation. *Value Engineering*. №28(3). P. 145–146. URL: https://kns.cnki.net/kcms2/article/ abstract?v=hUjjRxyvaVPzJbhir6apN3ZWxJHhMkP7V5plUWI2vic6WLJdMtGU4sI g9pbYeG9YdwqO7Ej6gPC9xgVoAtR3lqpSpU1EFJ5e8M2yh786Cn9aZ6BKvg-zFm kuOw7k9HRrFo0QC2HWJq1dmDiOyfIEAA71coQ_wQEm5KvIf4pF-__DXBFVi9y G1Q==&uniplatform=NZKPT&languag

28. Liu Y. (2009). Tax planning and case analysis of real estate enterpris es' business operations. *Commercial Accounting*. №14. P 31–32. URL: https://k ns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNbBiJji_-RtewLng5trGkjqJ0O9riy C4CfgZ8VRefk3oeArjW5NIv4XQ0g9CRbpNZs3bWm6VFYSbLnwPh3QdhDRNb Kh_dehxOo3vWO-556Ik_rMRGu8BckvZpT0-y8Aen4GL7pjq0a8yJKSd9QvTW-2h 88mdegDjE=&uniplatform=NZKPT&language=CHS

29. Wanxin X., Lyshenko M. Modern concepts, principles and perspective s of business process management in real estate enterprises. *Economy and Soci ety*. 2023. №52. *DOI:* https://doi.org/10.32782/2524-0072/2023-52-22 URL: http s://doi.org/10.32782/2524-0072/2023-52-22

30. Wanxin X., Lyshenko M. Research on business process reengineeringo f real estate enterprises. *Market Infrastructure*. 2023. №75. *DOI:* https://doi.org/ 10.32782/infrastruct75-11 URL: https://doi.org/10.32782/infrastruct75-11

31. Gao W., Wei S., Geng C., He J., Li X., & Liu S. (2024). Th e role of the real estate sector in the economy: Cross-national disparities and t

heir determinants. *Sustainability*. №16(17). P.. 7697. URL: https://www.mdpi.com/2071-1050/16/17/7697

32. Sundakov A. (2024). Post-war reconstruction and disaster recovery: Lessons for Ukraine. *International Economic Policy*. № 41. P. 65–79. URL: https://iepjournal.com/journals_eng/41/2024_41_5_Sundakov.pdf

33. Zhuang R. (2025). Evolutionary logic and theoretical construction of real estate marketing strategies under digital transformation. *Economics and Management Innovation*. №2(2). P. 117–124. URL: https://www.gbspress.com/index.php/EMI/article/view/277

34. Zhang Y. (2025). Transforming real estate marketing: Strategies and innovations in the digital intelligence era. *Highlights in Business, Economics and Management.* №60. P. 101–107. URL: https://doi.org/10.54097/rgxsn498

35. Mohamad Bakri A., Rosly S. H., & Ismail S. (2021). Success factors of marketing strategy in real estate business. *ASEAN Entrepreneurship Journal.* №7(1). № 20–26. URL: https://ir.uitm.edu.my/id/eprint/46905/1/46905.pdf

36. Wang F. C. (2023). The present and future of the digital transformation of real estate: A systematic review of smart real estate. *Бизнес-информатика*. №17(2). P. 85–97. URL: https://doi.org/10.17323/2587-814X.2023.2.85.97

37. Razumovskiy, L., Gerasimova, M., Karenin, N., & Safro, M. (2024). Implementing dynamic pricing across multiple pricing groups. arXiv Preprint arXiv:2411.07732. URL: https://arxiv.org/pdf/2411.07732v1

38. Walacik M., & Chmielewska A. (2024). Real estate industry sustainable solution (Environmental, social, and governance) significance assessment - AI-powered algorithm implementation. *Sustainability.* №16(3). P. 1079. URL: https://www.mdpi.com/2071-1050/16/3/1079

39. Soyode E. O., Afolabi Z. O., & Diyaolu M. (2025). Evaluation of digital transformation strategies in the real estate sector of the United Kingdom. *Asian Journal of Economics, Business and Accounting*. № 25(11). P. 400–413. URL: https://doi.org/10.9734/ajeba/2025/v25i112061

40. Huang H. (2024). Capital operation strategy of real estate enterprises based on financial management. *Accounting Learning*. № (05). P. 40–42. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMY00o6GwgPgKha4DcLhwtS5q2wK493YLf383WfYX7fazQI2yUorVuCUe-jRBc5Z7BesgYQgW_vGvUTtBXVqqfyC6TQE8HnRPrQ4I73Ao2W2fRQWd8QUBBk6HWEz0L6g_t8hNnTGoYTrMuzDTa-i6vT_BBjM5RCsak=&uniplatform=NZKPT&language=CHS

41. Chen Z. Y. (2023). Analysis of the impact of industry-finance integration on economic benefits of real estate enterprises. *Tianjin Economy*. №10. P. 88–90. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM6U-t4RZMDxO5_Vw8Q9WJxYA7ilQwegcNc3mbnRmlSm4f3TMZvBnSUllQ5pRqUffJ9-eQyjEzlDVmH45ePEuChLIn-bRn0QFCiCuENIvyTB_FBu79MrZwhkblHV52iPoM9402hr4vIdLOSmteFbEcRFJ7b9Y_9lOk=&uniplatform=NZKPT&language=CHS

42. Wang X. (2025). Research on digital transformation paths of real estate enterprises. *Vitality*. №43(02). P. 193–195. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNLqsWjbtEzG_5uVIuRoIApqua7biS6lEaQUkqIYsOWYjhWhJjkNq5P3gkb-PfYqb7_xzaSEngn0j2Goxz4jBFwbA_CJRy4c1dxDjNo8cjEzd-TwcAvdsiHBBRt0lC-NnYcEO2swrDqlsg-HY1V0di4uOL_P-_28-c=&uniplatform=NZKPT&language=CHS

43. Yang Z. D. (2025). Application of digital transformation concept in real estate enterprise operation. *Digital Technology & Application*. № 43(02). P. 148–150. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPm34MNwk0KhV9e-ioukaNOvv-fgZqeJW2WjeiJSfLMRsBGtDCZQzu301oWpYm5tYzrPauGDc_FI7mAxzJPLXzEifsbVeE3pejtFrwVYhnEwLKPF3wLlmoXOTLVpzde8d7Dj9SPR9X-64yzW6RCSdxW6SQ_B6zG2Hs=&uniplatform=NZKPT&language=CHS

44. Zhao X. D., & Hu Q. G. (2024). Analysis of pain points in green building development and exploration of breakthrough strategies. *Real Estate World,* №22. P. 1–5. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNpxkrWe0V10_6IpraqVtN01-9hAzvOVnlAG__Gau_iJDlEE56FEC9I35gaTW8Ynv

qEftlBHwGaBTRAK4-25v_ojEujD5KG5gVMihlvBfQ-l70VRU48c_h7GdObTeqswgeFJd22G4behi_UJndaKvUg0YKx8Zx2_KA=&uniplatform=NZKPT&language=CHS

45. Lyu M. Y. (2024). Financing difficulties and solutions of state-owned real estate enterprises under the ESG concept. *Caixun*. № 22. P. 83–85. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMAVcaWNkrBVVVx2pDzMtXSTMvWcdXNBIsjiBjEHTvfvi-pX3Jzr0ZJjddD0LEqEw5KwiqbXOuNK-vJxsAU_KvOpoqpQF3vn0rHioRMBRQjtah54au4XlFrBFKHw5Y6PSu2XeTQUkBSMy0Cx0bFVLOJo09k1i0FLqg=&uniplatform=NZKPT&language=CHS

46. Tan H. Q., Du J., & Zhu L. (2025). Research on ESG information di sclosure strategies of real estate enterprises from the perspective of legitimacy. *Journal of Engineering Management*. №39(01). № 141–147. URL: https://link.cnki.net/doi/10.13991/j.cnki.jem.2025.01.023

47. Lu H., & Han Y. (2025). Research on the mechanism of ESG ratin g on financing cost of real estate enterprises under the "dual carbon" context. *China Economic & Trade Herald*. №02. P. 43–45. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPuOM6cF6txlhbtqZx1GnDISAYxx9syPCsZFpN13UmcGRxrJElyGzj2WG4IFU6OPzksDzbyTljNjbca8v7kefaDSjRlul_vF7Wxk4VoS6eUnE4waDJVgSoITJhLvLhoZEM74ngtA7KHqZ2c6ZvggYQkk7Z2Ck0BluA=&uniplatform=NZKPT&language=CHS

48. Zhang S. C. (2025). Urgent need for strategic transformation and bus iness model innovation in real estate enterprises. *China Business*. №03. P. 50–52. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNPkxdPE7lgLxU_Cxl5152W41SAm57-BRVkh_o7HtGIa7oD5ZIaUKL9okxIPPu8xboEuQtKiVOU5uAFnC-v7t7birUuBS5hXw6DNaXDb9deQfZ_atXoBh5HAdjBKD6TOz2UJzzmGkB0Hygdcw0q2b6sX-ui2tyQFms=&uniplatform=NZKPT&language=CHS

49. Li X. (2024). Innovation and practice of real estate marketing mode in the Internet era. *Housing and Real Estate*. №15. P. 120–122. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO3v5FRPHN4inUbpHvk1a_CYz4

_pP1RtuW-iH1zZ5Lc5cZ0YeHP1rvUo2-sT5n0t1kEf-dPm79Dpw5BegT7VZhxSe1pZSso_8xQSNVGfk8-GEGb4u0RIyCpnUe8h1lfagpkuokV7kzdNxxnFMfrf2u7TAWKs6ORVT0=&uniplatform=NZKPT&language=CHS

50. Huang W. (2024). Discussion on problems and countermeasures of cut ting-edge marketing technology application in real estate industry. *Enterprise R eform and Management*. №23. P. 110–112. URL: https://link.cnki.net/doi/10.13768/j.cnki.cn11-3793/f.2024.1224

51. Lin Y. X. (2023). Effective strategies for real estate enterprises to i mprove financial risk control ability under the new situation. *Guide to Popular Investment*. №23. P. 188–190. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM6U-t4RZMDxO5_Vw8Q9WJxliZtDH0VaI2hVAFXT4fjKT9TGTa_ndQv49mur4PwnIqM6-RD1ClK8eglZEAPJNE4aGyBQAcZ63vMeM4yaLB8SKWVGnV6d3ToIK0TperJOJKrXUVfL48KkykF9Pvq6iwL5QEBDmvosMw=&uniplatform=NZKPT&language=CHS

52. Wang J. (2024). Research on financial risk identification and preventi on of real estate enterprises. *China Price Supervision and Antitrust*. №12. P. 117–119. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPOZDKNcSRPQwunL_snOQKkuKKkEpktnOhXDBDDpBx8bTk3ufVMulTHsbsbTMEvnp3MoPs28Gn9YyOkaMfOPgK-wHDAaFGRQAkvu5sJxF0wAdl2Q-Ss1yJxR7gPg8NoBwYz0nK5Eqo2VcrTZCFEqe7oHkWMjwYqb7c=&uniplatform=NZKPT&language=CHS

53. Liu Z. (2024). Influencing factors and countermeasures of economic fluctuation of real estate enterprises in the new era. *Chinese & Foreign Corporate Culture*. № 02. P.54–56. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMo8tb_EH9M-drLjPBqNvswSUUBC9vDtORjiu0XR1528kBUEZA7nO6pNe1uAgClI_pOUHcs-EJTwiA5pwUs07kiAVrTKCujU-cLXcqG4IgygoJo-0SWY2yQS1x24-XDafGYKtlki8bFDvo0FTHKqkEWEdVoOzbvq5I=&uniplatform=NZKPT&language=CHS

54. Zhou X. K., Wang C. Y., & Li J. Y. (2024). Fairness and efficienc y issues in ESG rating data processing: A case study of ESG ratings of Chine se real estate enterprises. *New Economy*. №09. P. 101–119. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNAfKVI8k_VBcPKk_zBEMBKh_Fa-ahaMEWh047B4EqALQidu0HysdRu7NEdmRgMKazgZh3Cpj99-8_AEsKErTA2fy0v_RVgWq7nJ1qI6Y6CQTb5XbWlqbcCVEi2ETqJIgfDIGrRQqDnKKAWyvHylu2nzIWtbjCdoeI=&uniplatform=NZKPT&language=CHS

55. Yu G. J. (2025). Research on digital transformation of whole-process cost and cost management in real estate enterprises. *China Housing Facilities*. №01. P. 118–120. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNRhzP57ii94Kx-Vln7h-dQhDxzL0lymeihTavt4zOJswg23_65EaPjGBujWgoPLEhYzA4fV-t9RFcoQOo9cIqcvlW-fKL-C0HCX0iSP-B7XqFjvWUvk7Z_FX0eITNAJ38MsigILpVD8trXWHCwXove2LUdoOqZmuo=&uniplatform=NZKPT&language=CHS

56. Luo X.Y. (2024). Research on ESG practice of real estate enterprises under the "dual carbon" background: A case study of Company A. *Accountant,* №21. P. 23–25. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMZLYKBA7PDCZamkCySqmYLQ3cKX5lWcQUJk2ss7sHBXm61yAw4InPRfJUmdA15jIRRsQcG0Pt4TWuXZcStSziwS0V-z1-uE__mxjdRz27qZ--QHFR9MXGIHg0njD-O_zCcNRjRD5lKFQaamt8wGmxn3khjlqWAvfY=&uniplatform=NZKPT&language=CHS

57. Gao G. P. (2025). Impact of industry-finance integration on cost contr ol of real estate enterprises and optimization strategies. *Guide to Popular Inves tment*, №04. P. 100–102. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPnGqJV52q5hnq6XB1udtKWFA4KVZ3FRmwJ65zZ7C2rmYNCA6dE_6Fei9OLwGh39ITl_6K-IoDFlR1qTXDXM49y890pCkloHdVBZp9Rqee0qJpmcUA6INcP6VC-pi-y1TgjyQ6_JpegVt4S2fD1APFhxYwJmZLFa-c=&uniplatform=NZKPT&language=CHS

58. Xu. G. C. (2024). New thinking on cost control of real estate enterpri ses under the new situation of stock. *China Economist.* P.12. P. 41–43. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNAhcb78J2D8-dZ6pO9w gE4LfG3I2N1kl0jhLPq3GWOg8cVA5WeGQm_iNHVQwtm8n3LKnGSZCBQT8W NkkCRD8rGOZumCmV8SjZtsvTipobUJdMchiOgwKwgwVmdKDR__R8-fNvJ0pR UGfp0LlxFEq7pnYCJ_T9NLUk=&uniplatform=NZKPT&language=CHS

59. Ouyang L. (2025). Analysis of flexible human resource management i n subsidiaries of state-owned real estate enterprises. *Market Weekly*. №38(06). P. 172–175. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOM5 QKio0XxF6cK4UVKWQS_R7Ho_l0myzTbtvNl_y4C6CoedCtOWMvXLGVe_TO7 gfLsNPIzYrc-l21xe72nHhvRulIDWuG2yosSWYqCIZqWNQA26efg57i42a9qUzkIG 2EUeazmFmR3KVQsCf_EBIn_NvleiVJ9sJA=&uniplatform=NZKPT&language=C HS

60. Sheng Y. H., Tang Z. Z., Mai Q., & Wan F. D. (2021). Lifetime res idence: Research and practice of composite module method for real estate hou se types. *South Architecture*. №02. P. 115–120. URL: https://link.cnki.net/urlid /44.1263.TU.20210302.1128.004

61. Lin S.(2024). Financial transformation path of real estate enterprises fr om the perspective of industry-finance integration. *Caixun*.№23. P 87–89. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOZ2fRcppCAhgRYmsXF Gv6CeANRN5LipFquYCeqEMgc-6FgszsZny-JXVL57apU3Br7WMtJEHOIzCOVz upfj47Eg5SVIxeohPStZkOgROBLHuj_zr5Yi7Jyjg5ZLCW0RsX8v0L5d-Dxjsjd86O Q3vxTYO-seRAfPYg=&uniplatform=NZKPT&language=CHS

62. Zhang Y.Y. (2025). Research on cost control of real estate enterprises. *Real Estate World*. №02. P. 128–130. URL: https://kns.cnki.net/kcms2/article/a bstract?v=hUjjRxyvaVPz9ZssxJcB1-Kd1_gepDSiwhgfTyCz6OvLtM2wmgVMsvoi V9WiI7iEebGVThuHrFT_-VsFcwJ9QiLgeMy4s7YrvyNs6ACS5y-a9mCe5GUANM ZSVaAEIfHnIge46Uc_KGd9MTNCZ6qoSYplTSargZMBmuOi-GZsNuE=&uniplatf orm=NZKPT&language=CHS

63. Lin N. (2022). Thoughts on comprehensive budget management of rea l estate enterprises. *Co-Operative Economy & Science*. №12. P. 134–135. URL: https://link.cnki.net/doi/10.13665/j.cnki.hzjjykj.2022.12.028

64. Wang M. Y. (2021). Discussion on expense management of real estat e enterprises. *China Collective Economy*. №15. P. 127–129. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNsZmCPR2x6Kny3N0Lz4o1gvrMmnbUkSfSzP_-kYaSjbX2APO5SWAhT-95FzuR9orTlwxe3lUr7qs5PeErSq_RyJW9V5hygokGDMmAMsPKGCQQRxrb8r8uZtnoZUxXnm8YEtEyqthe_8hi3iv1nw6c7Wd8KUTVpE_U=&uniplatform=NZKPT&language=CHS

65. Lin H. (2023). How to optimize the financial internal control manage ment system of real estate enterprises in the new era. *Accounting Learning*. № 11. P. 167–169. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPOA8w_hemH5_IX7MhauzNC27VJs3TAw2vUCKNoga4Pf6JdAQa6OElsLh4oRoRx2eXrbPibBY6tU4GQra-ipISROa03fE3PAGznJxfc5RuCkouldFkoE5C2pv3QVG9KXB3oJHClIRadvzF7m-6lPEleRNE1qA0XJUs=&uniplatform=NZKPT&language=CHS

66. Zhang T. F. (2024). Impact of debt structure on financial stability of real estate enterprises. *Caixun*. №10. P. 84–86. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNLrNTt5kBn7EOhD6p4HMtXcPK9xXSL6c8VlIPNUBHZsJm8s2GvVR_8y2_DPMv2tQVDJYl0BP64-tY9K7cvbhzrOLVIXCI0KZxvyEpy-cagcsf12JTatmH37OT_ifHir5WXqD7obAnqjVxLFMO5CZQws2klXvY5_8s=&uniplatform=NZKPT&language=CHS

67. Wang C. (2020). Analysis of financing risks and prevention of real estate enterprises. *Times Finance*. №14. P.31–32. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMrD0dPjbE9JU4pVvxo8ydkxO3OONnt2SpSRe1e0HvEOWhYijAcJG7n9jvpIpZEZ3Zy_-JJKMOBbrK2dNgUcT1YGvDosFSkvv7bV0Dp0KORvAyg0tGccVmqXJA2507IrD5mUiiEZn_MIv7r04MPn1Wjt1Kd2_7kuow=&uniplatform=NZKPT&language=CHS

68. Zheng, J. (2025). Application of fine-grained management in the whole process of real estate enterprise financing. *China Business*. №23. P. 252–254. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNNmGnruKNX2wnMt6Sz4xh9KX1ItwakL9JhwYfWynSuZscgFY1NQ8LWWk8CvHj9BD8bktTAFgtdljtrZJyq-KXdYwJ31a18HSYxHki6qQp6K-RURChk9EIgh6rkCF0S_Q4VdqtmJ8Vn1z8Ab-4ePzoVmoH9ipCxXuA=&uniplatform=NZKPT&language=CHS

69. Li J. (2020). Review of the development of big data in the real estate field. *Journal of Henan College of Finance & Taxation*. №34(03). P. 60–64. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMXJFB7f9ulk5lYUf_tob3jiV3QQemHZ2FcUaCjhAOXzGM2f9m27eallmAcjQSWiv-cEVSBZlj7zSoLkw1Z2F4rSGrACYM0pH6Bk05F6nNUk8JhT02wHVE-zH1mdwcsaiK19HOTzVQ4I3Alt7544SWI2zmkqx4wiAw=&uniplatform=NZKPT&language=CHS

70. Zheng S. G., Yan P. S., & Li J. X. (2023). Effect evaluation of China's long-term real estate mechanism. *Statistics & Decision*. №39(03). P. 179–182. URL: https://link.cnki.net/doi/10.13546/j.cnki.tjyjc.2023.03.033

71. Li L. (2022). Analysis of innovation in real estate marketing strategies. *Modern Marketing*. № 16. P. 162–164. URL: https://link.cnki.net/doi/10.19921/j.cnki.1009-2994.2022-06-0162-054

72. Guo Y. Q. (2024). Strengthening internal control to empower the long-term development of real estate enterprises. *China Market*. № (30). P. 110–113. URL: https://link.cnki.net/doi/10.13939/j.cnki.zgsc.2024.30.028

73. Gao W. X. (2024). Internal control management and risk prevention of real estate enterprises. *Sales & Management*. №27. P. 93–95. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOF8psxMMsiungx12dL9fRLwf6vPz5FvfT7eRNnpog5DWxoyvibiwDCaaEzPec58QsyTt7FQoAqkS4U4lCdG66HJlAeWbbwHnJijxsVEO3AQdGa7h4mYDqlXLxutlDByzJfnyKtQDm1VsfI_OAi0uXAskT2FI-8zOw=&uniplatform=NZKPT&language=CHS

74. Liu Q. (2020). Discussion on the deficiencies and improvement suggestions of internal control in real estate enterprises. *Money China*. №19). P. 15

6–157. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO4qEgjWd5uKfragfNlmZyAkU2N_BaWDdkOSQuuB_s9zsYtZQv05-b9IzNY7Huv2gcDdlCMyHRFhqy2OYvGO-wOThxL3hYeO0zmwph40-aL1UH-WHN22SwJqtRdeM2m8gEcvjewhBg6CV0toDYuKoSd2UFL7nHSTDE=&uniplatform=NZKPT&language=CHS

75. Wang F.X. (2022). Discussion on whole-process cost management of r eal estate development projects. *Money China*. №24. P. 63–65. URL: https://link.cnki.net/doi/10.19887/j.cnki.cn11-4098/f.2022.24.029

76. He X.Z. (2019). Analysis of financing mode innovation and competiti ve advantages of small and medium-sized real estate enterprises. *Enterprise Reform and Management*. №19. P. 111–112. URL: https://link.cnki.net/doi/10.13768/j.cnki.cn11-3793/f.2019.2571

77. Li X.R. (2025). Exploration of the transformation path from financial accounting to management accounting in real estate enterprises. *Market Weekly,* № 38(26). P. 135–138. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVN2tkEjnbMUPTqyEu5KNcpB79keIQbY-abcYnPMO6xXHkdvl80zH_4DslX28f3lPVnmbBh_IOBEUM7hGk2fRiHW1Uk3IIfBN4GNBTgILhDwe32oMEX8V3fegp4tAlFWtv4T3g0L00TaAQokF_kKm0I97NqscJapxjA=&uniplatform=NZKPT&language=CHS

78. Liu L. (2021). Current situation and development of financial manage ment in real estate enterprises. *Business News*. №09. № 32–33. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVN4g_FC-jW8mWxTKfUgx8mvIsN5fkmJVujhKeZW9GZcfqkGoPPOfx4iQ0Sc75UR5XdqOA13DHsTd8Gc1U1Q4vht-zcThnMTQSg_zAYd_dOEu76fvF4y4NuTBBcVWTyJF-QTVRQzfVnyx6grN_RPRKQf7Nff8MVO8LQ=&uniplatform=NZKPT&language=CHS

79. Qiao Z. Y. (2025). Discussion on the transformation path of real estat e under the background of rural revitalization: A case study of the Future Sci ence and Technology Courtyard Project of Henan Vocational College of Mech anical and Electrical Engineering. *Housing and Real Estate*. №33. P. 41–43. U RL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNljqxi8D4NGJC78uG

jiVgvMaGAZAVz-cATMZP8s1_OCbT56OM-XthdheV_g9Oz1Hb7CjqXQRBNTooruyljXfKebCE1j3HeC8xbYXxa6MKwEdyCCjtThshel-yQacjfUqdANjQ-E3zzt5W6rEA0TdDzqnOi4Bcu1nU=&uniplatform=NZKPT&language=CHS

80. Xu W. (2025). Research on capital management of real estate enterprises from the perspective of risk prevention. *Chinese Agricultural Accounting*. №07. P. 115–117. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMVSeTf37mjCMMJd-b0NoIlConEa_ROTHS3hXPOJbG5-axO6JC4z70_syICGF2PlehpIEmrtWaYg0vjFHnKfewSM3BNz-0VI_CmH-WrymcxTgo9ZW7Azei4aC6BOXFzlaUDZQnnXKGBy-WJ1YX7KcuG-IoSdRblWhc=&uniplatform=NZKPT&language=CHS

81. Deng X. X. (2021). Thoughts on problems and countermeasures of financial analysis in real estate enterprises. *China Collective Economy*. №14. P. 159–160. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPpwiUdaxxqY9mS3DiOuXyIwEvSalPLTOuKWo3useOcgmMH8ihRgFA0VWGPjLBeF6jEz229gbghJFnKLI-yP3YrtnDOcmMvYh3ohi0pu6pPu0TdVjwKce-ous2pcpn_pFucxPDMm1RH6x9ozo0YR8SlN0tuaYETBkc=&uniplatform=NZKPT&language=CHS

82. Chen H. Z.(2025). Financial value creation path of real estate enterprises from the perspective of data assetization. *Tax Paying*. № 19(18). P. 61–63. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNqgHfpJEnW4RGnWIKuXflPJSKW0sLmGvPTW48n4-JD78m51zSVwhJO4jqntk4r2CuhUp7F3uRbCJ2n80hU8Oxj7vV9PGwv7r0ky5n3vQtQBySisJOQ7yiY5cSk_quh0H9zZIUTPrhxnBzY-32RcVT1uo5P721HT9U=&uniplatform=NZKPT&language=CHS

83. Wen X.Y. (2025). Exploration of the transformation path of real estate economy in the stock era. *Investment and Cooperation*. №11. P.52–54. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPlryjisnuirndiLFoFVrhW7BzK7dYvgVoC_zNzGneH0VRPFGLWBpE6VQaKVg6It59NxFqSnePwPrkR8aVLdEfjxLWbHaRc8yCaBi6d25_Nbw0_CGwZw1Nq4DIuthn6OhqohbwYP6jtLUUdCI7-WxYft7lTRqR6Bh0=&uniplatform=NZKPT&language=CHS

84. Wang L. S. (2021). Exploration of the path to promote industry-finance integration in real estate enterprises in the new era. *China Circulation Economy*. №02. P. 99–101. URL: https://link.cnki.net/doi/10.16834/j.cnki.issn1009-5292.2021.02.032

85. Hang Z. Q. (2022). Digital symbiosis: The 3.0 era of real estate digitalization. *China Real Estate*. № (20). P. 74–75. URL: https://link.cnki.net/doi/10.13562/j.china.real.estate.2022.20.008

86. Fu Z. S. (2025). Optimization path of financial sharing center in real estate enterprises from the perspective of big data, intelligence, mobile internet and cloud computing. *China Electronic Market*. № 31(17). P. 85–87. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNFrYa2ObNtbhte3B-qybhnHzQIeOF2DJcVh5OqVQFstEZ9wH3XPRZp-mrdqU7EIJXIz0TkQIffYoRpkgiAWYWuhw259wDffG93sj0RmeOF7awNkRWdInVW8M0RPmMyEJVNCYqn1iayl7lPh-JP8PI9SPdxitFNq9E=&uniplatform=NZKPT&language=CHS

87. Hammer M., & Champy J. (2001). Reengineering the corporation: A manifesto. *HarperBusiness.* URL: http://pqm-online.com/assets/files/lib/books/hammer.pdf

88. Xiao W.Q. (2024). Research on the path of new quality productive forces empowering the development of real estate industry. *Journal of Changchun Institute of Technology (Social Sciences Edition*). № 25(04). P. 54–57. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNCxXyCZ5ontcsivzPmpnDVCYQDQRQZ2oaiAQYX0En3tqbSqOnR8N0iC8ltYcFV779X2LDr_5H1-9pxRcPWPW0HPeMnw7Di3fBOpHhXyAr7WKkGRLFIbbuqv9gBCnoZ-9YcoBs7vQDWw_BFOvGTAxye4PUJJOdJ8hc=&uniplatform=NZKPT&language=CHS

89. Qi L. B. (2006). Statistical analysis of Likert scale and fuzzy comprehensive evaluation. *Shandong Science.* №2. P. 18–23, 28. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOMTTYhCuZMX7Z-oDrJ_dkRYYVlWTmErxNpsClW-3BhrGO-yxcirz61LllProS5dOkU1a3fK_F_Xb-jEEW5occxr_zuD6b1

CUJOPu1v7x5oe48wTXjFOJhXS2x6hAFNJJuAVgXNPIrRYyeXWupEE5OoH_VMtx2oPUc=&uniplatform=NZKPT&language=CHS

90. Liu R. M., & Zhao R. J. (2015). Did national high-tech zones promote regional economic development? Verification based on difference-in-differences method. *Management World*. №8. P. 30–38. URL: https://link.cnki.net/doi/10.19744/j.cnki.11-1235/f.2015.08.005

91. Gao, Y. X., Yang, M. H., & Li, L. H. (2018). Excel and SPSS analysis of independent samples t-test. *Animal Husbandry and Feed Science*. № 39 (10). P. 79–82. URL: https://link.cnki.net/doi/10.16003/j.cnki.issn1672-5190.2018.10.019

92. Chen Y. M., & Zhan Q. (2019). Some misunderstandings and correct conditions of using two-sample t-test. *Statistics and Management*. №2. P. 40–42. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM6cbrFl4sZyg4sZYhVQ2e8taiXXblsvE1spuc6KBj-AOut2n0qA96WxTJvOkJApX8Y4_lgRSy4DEjO4OewNiGbPh2Smhfte2oZywEaV4jAP0qbENdya_NVOtOaMe7EMUpunQldUSZlDrDxIGKVRxMhzAFIGkqjPulVohOU1Q3mqA==&uniplatform=NZKPT&language=CHS

93. Li W., Zhang B. B., & Wu D. (2020). Optimization of bilateral homogeneity test of variance for two normal populations. *Science and Technology Innovation Herald*. №17(16). P. 210– 213. URL: https://link.cnki.net/doi/10.16660/j.cnki.1674-098X.2020.16.210

94. Wang F. (2006). Research on process optimization and ERP planning of Xinbei Real Estate Group (Master's thesis). Dalian University of Technology, *China*. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOtfh8E7QRPkfsIWAk_4bbRP8TcRfPbKVw3B9uqPgDUBkAQeF0dAMxiRV_oaRcr9c_RWr9Fyg6902f9E7Y-VQ8U_7UBABnvBZHlN-k4woeXT1btOdE-1oXfSIvZj3Qah_9ab-953bBof8BTz6wIM2XtcJKsajha4Q0=&uniplatform=NZKPT&language=CHS

95. Liu T. (2014). Research on working capital management of real estate development enterprises based on business process management (Master's thesi

s). *Chongqing University, China*. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNKX4l6QkJ02XK4UOni3FVKUg_WVaHB61CEz3wtu5WTZT68ypB6zet04hUBD3NHZg2wVV8OYesPqGss2IGy6WcLD_GjxLgB1veJjbIxiQISO-l6KNgXNvoDnsT5hWpaqgURI6Q4yBT6ZWvpPSbpSsbmvFCEbysfmRs=&uniplatform=NZKPT&language=CHS

96. Qin Y. (2017). Case study on optimization of real estate on-site mark eting process (Master's thesis). Huazhong University of Science and Technolog y, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOKK0wGUnB0dBnexProrn552zLXlo0hRsN1AWjXezMOOmk_gmAOIppQvelU0yRw6skpD-KUTKjLNAGh9hBuYKSzcoS9Wk8su6teW5lsI-J4wiJ3Yk5NPjs7EwSu_XHH7ug3uqVMbEiO57vs-l0QN69vBrhtaLgbMg4=&uniplatform=NZKPT&language=CHS

97. Wang X. (2017). Research on marketing management optimization of Sunshine Square in KS Company (Master's thesis). Nanjing Normal University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOKK0wGUnB0dBnexProrn552zLXlo0hRsN1AWjXezMOOkcUI4jW1oEsaJG_D-oMj6mTTzvCfQP4hMjKXYRYWWFJ9iJPQhNPJIQ5bvpVKnTt_8ZnyG9Q6Lfzg9x26O_CjWPasG6iq00oNwMr7UiDLBOdM4QKvbagRPs=&uniplatform=NZKPT&language=CHS

98. Xie Y. H. (2019). Research on working capital management based on business process (Master's thesis). Zhongyuan University of Technology, Chin a. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOTlXh6Y0vGraMxHkBj_th6OX543TBVSJySYdHOq1l3MwxaiAb9QDQEU_8jNmZ4oTQ-IKyPdY9V0cOUul0dscx6u9rsujIrsNa99rfeDZsnAeJZKjV3Hq9mWGbLRk-j167a7XPEVXM9ZNDb6Gic505kMsLyayFL71M=&uniplatform=NZKPT&language=CHS

99. Jiao F. Y. (2021). Research on working capital management of Chong qing Jinke Real Estate based on business process (Master's thesis). Chongqing Technology and Business University, China. URL: https://link.cnki.net/doi/10.27713/d.cnki.gcqgs.2021.000403

100. Liu X. Z. (2023). Evaluation and improvement optimization of Hops on Development real estate operation management (Master's thesis). Lanzhou U

niversity of Technology, China. URL: https://link.cnki.net/doi/10.27206/d.cnki.ggsgu.2023.001844

101. Liu X. Y. (2023). Research on defects and optimization of internal control in sales and collection of H Real Estate (Master's thesis). Chongqing Technology and Business University, China. URL: https://link.cnki.net/doi/10.27713/d.cnki.gcqgs.2023.000530

102. Lu L. (2023). Research on optimization of project construction process in H Company (Master's thesis). Hebei University of Technology, China. URL: https://link.cnki.net/doi/10.27105/d.cnki.ghbgu.2023.002071

103. Liu X. K. (2024). Research on sales management problems and countermeasures of TY Real Estate Company (Master's thesis). Shandong University, China. URL: https://link.cnki.net/doi/10.27272/d.cnki.gshdu.2024.008257

104. Chi X. F. (2004). Research on informatization of real estate industry (Master's thesis). Chongqing University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPVVk3YPfbWKg_uuI-aOPH0PyqICohR_omDZjHkFtCEZluyQindugyAhd0V9CX-1wmKC0AxZvSl_x4np1QXCqJG85fduImUB5ELMplTHY9TCRRyUY3KX4LjomOacTNL08cryV9O5C5sZh_1DqVgmdHo6kG5zgkcz-s=&uniplatform=NZKPT&language=CHS

105. Qu N. (2009). Research on ERP project planning of Weidong Real Estate Group (Master's thesis). Ocean University of China, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNM_EdDQPzEdOjUUjD7SL9KoPLY1jgs8EDfX53Jl32EgvsY8t_XnDtunQmM6NTBmskzH-6w9UWuX6DAXvsiu-sG9ZTqBWssl3F4pi-g7E3SuSrPfm5eZlE5F3N9lJbbrJH_st-csZ1nHaYpHMKHpPA4uZOJi9Bf-Jw=&uniplatform=NZKPT&language=CHS

106. Chen A. H. (2015). Research on application of ERP system in Jiangsu JY Real Estate Co., Ltd. (Master's thesis). Southeast University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNq0VIcnvibwEJjqehBO8XmRflQ_d1660ZVhSWJze2YPwcOcHZvKCtUD1PAJl1uJmg8yu73mEtaL4jqnL

0rsv7LNgQkgWF4Y_VYtlegWq3MokrZ3r9GnocizZvkfox4ykK5c7yzfhwaqgn04nt8aBQ14sms52cjW6U=&uniplatform=NZKPT&language=CHS

107. Wu Y. C. (2016). Research and analysis of Baoli Real Estate sales management system (Master's thesis). Yunnan University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPL-M5AKHb-H3i60Z8QpcEPWTzjN56gmjMY_2xJJCSa_mrfOO1EsqRrtpRQNU0XJWUrHEbnDTTf8zWfNF2lIRsovqUor2o3rDnzfK2GPR6Gy2CPC8qUEe0YqDSKTp4s7U0oE3vJiTPg8FdTyNbXTre0QGudw6EMDE4=&uniplatform=NZKPT&language=CHS

108. Chen Y. N. (2017). Optimizing the as-built measurement system by i ntegrating real estate CRM data. *Journal of Civil Engineering and Managemen t*. № 34(1). P. 79–87. URL: https://link.cnki.net/doi/10.13579/j.cnki.2095-0985.2017.01.014

109. Luo Z. F. (2021). Research on cost control of H Real Estate Comp any supported by informatization (Master's thesis). University of Electronic Sci ence and Technology of China, China. URL: https://link.cnki.net/doi/10.27005/d.cnki.gdzku.2021.002505

110. Xiong W. W. (2022). Comparative study on the impact of different social media applications on real estate enterprise performance (Master's thesi s). Henan University of Economics and Law, China. URL: https://link.cnki.net/doi/10.27113/d.cnki.ghncc.2022.000598

111. Wang Y. (2024). Research on the motivation, path and performance of digital transformation of real estate enterprises (Master's thesis). Guangdong Polytechnic Normal University, China. URL: https://link.cnki.net/doi/10.27729/d.cnki.ggdjs.2024.000060

112. Li M. (2024). Research on optimization strategies of digital marketi ng business in A Real Estate Company (Master's thesis). Northwest A&F Univ ersity, China. URL: https://link.cnki.net/doi/10.27409/d.cnki.gxbnu.2024.001429

113. Chen F. (2009). Exploration on the application of CEM in modern real estate marketing (Master's thesis). Southwestern University of Finance and

Economics, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM_tAvpbqSbo-XNazyYf_0bggwIVp-uR24BGsjwVmBNueqONrjcZjctihYl2lJp2xsS0Gbxwsug-JHCyVbFqblsq1_Wxsh0GtphHpiAIL9LfVw4gSH9Q_H3PxQKPmsYG6fG3HtyxtPzgJ83D46sTNIDE3pvg80pbuQ=&uniplatform=NZKPT&language=CHS

114. Lv X. D. (2010). Research on customer relationship management pr oblems of Capital Land Shenyang Company (Master's thesis). Northeastern Uni versity, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMSZda0M_flcPxVbnu42SxEdr-jAhQzBFoD3FbRG75OjvsmgOhWiDjl6TD3Bb9_b6rqEhWyT5zm2PFFKgclfGzfDLLMqyAa9S-IWXc304n5kxYbEZXV4fuMlPkkVI8m6EQQF_ItUiUFlyvf0zARFSWIrF5q_Ax_SLo=&uniplatform=NZKPT&language=CHS

115. Zhao L. Q. (2013). Research on application of customer relationship management in real estate development enterprises (Master's thesis). Zhejiang University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOoaCjdtF_-0T68TBLmDC6HdRykFDt_DerUyFflCp4m67tE9HQGO4C3oysFZz0YifjjTwdetpHLv2F22NSBYvqHIneEn1gdtDgqi3SK4R2GXyUqOwhYQGs7N9XzzTIPqcvxjMx1U_g7I-3Btu_cKLrBhLwf-VpBfPg=&uniplatform=NZKPT&language=CHS

116. Zhang Y. (2016). Research on customer relationship management of real estate development projects in China (Master's thesis). Jilin University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMetLdiFW0A66_nphWBhu6ECDgMgEnVAvG4_2w2IBJomnJHmmFnA2ZWEidshZneeDwtLNbl9G3w_tgcStKWWtac7kgsA25qFmoLNb9P1iVOKKPqsowx-KB-tI2VUpqvwnTTZgrBJ_pLyGz-XlztZBc3YXrzxTzaKJY=&uniplatform=NZKPT&language=CHS

117. Ma X. R. (2016). Research on improving customer conversion rate of L Company (Master's thesis). Shandong University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO-oo-SYmA3Tom5D3saJfpGh_67mkvJn3hw_GDBcD7udFW-SxKZlX3IqhEske19gtijJv4m2iq2riORrZc7NlUTmTwYLiy

_sW0uxkGQC5qZSf1MAwtHpy_4pxvWextTzTZ33YSBsTnHG7Rn2_6YQZfyefkRenNquEg=&uniplatform=NZKPT&language=CHS

118. Luo J. D. (2017). Research on whole-process customer relationship management of real estate enterprises (Master's thesis). Xiamen University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM-LwCJOAIhbNeKiVO-vxbm4FTHeocQkL-zVDPAsyzXwqjrXFweY7jEVaZ8T9SEOCOksp8ZObxrVTP5cdFjyH6jF1C2OKz0nZDtwwbONIHtlbEwn96g_kttdEbx90WaqYyBThMi9WmR1oh5gCc-b4HIV97oAKWAZ8M=&uniplatform=NZKPT&language=CHS

119. Sun L. (2019). Research on customer relationship management of O S Company (Master's thesis). University of Electronic Science and Technology of China, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNwQ6KHCoSuehf_X8d-Fm9peqGxaH5FFk1VyAQf1vbTZ14RB5qLkd8tz7zkuH8rwEpJhzddrRCQa5IwNrHNLdkzcaOKEvdlrShemOtN3nMVtuBVqfNbrBJ-utGEaLwCSQaZSPyfq7UK_AR9jE0pF71Qs43zKZ7bDgA=&uniplatform=NZKPT&language=CHS

120. Xie Y. T. (2019). Research on customer relationship management of YY Company (Master's thesis). Guangxi Normal University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVMKc7mlThseKsSLzHedSfebcTU3ZbUIXGmJhBQozgVU99OroeE_d3cs-2Mjh1Xe2uKQf10FUrRtMcwNuwmkRv9S6GWnE8Hc6IZIOh47B_2zXEc0_FVxb93NZtZkI0nOU7a3XAtHKEwlo_ucLtioeKrxFccX4TKo8Ws=&uniplatform=NZKPT&language=CHS

121. Huang W. Q. (2022). Research on improvement of customer relationship management in Company A based on IDIC model (Master's thesis). Beijing University of Technology, China. URL: https://link.cnki.net/doi/10.26935/d.cnki.gbjgu.2022.000712

122. Li D. Y. (2024). Research on customer relationship management of Poly Real Estate Gansu Company (Master's thesis). Lanzhou University, China. URL: https://link.cnki.net/doi/10.27204/d.cnki.glzhu.2024.001200

123. Deng X. (2018). Diagnosis and optimization research on customer satisfaction of M Real Estate Company (Master's thesis). South China University of Technology, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM0UqgKbaGk9RDvceG6nA5ddbjUyTXF_SNuUwsX4ijpa3CspWbo0BZXJz3tjHop5nmG7vU2UGZ4Ka76zBnzrLxiH-XuXQ_VBU4XeytKNAcM-DEzAZJfYLg6-aFuwlS7YB-g7wu_d_-MeTIP4vI01mjlnLMB2O7wxSM=&uniplatform=NZKPT&language=CHS

124. Fang H. J. (2020). Research on optimization of customer satisfaction management system of ZH Real Estate (Master's thesis). Harbin Institute of Technology, China. URL: https://link.cnki.net/doi/10.27061/d.cnki.ghgdu.2020.005546

125. Qiu L. (2012). Research on marketing strategy of DH Real Estate Development Company under the new real estate policy (Master's thesis). Sichuan Normal University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOKNvyjSMqrW04xZ6M8BkLIvJnrXs8TBP-B9nJ6g9RiVZz-jLYNN5PTqeln0rIbjF0P-HQyEdx57_J2zmdflLIWJnaRgmUKCrpk7Xr57KGFSYNzOuj7h-z2Bu_dw-O7q8HTbHI6WKg6x6f0aVySMQfdZyM85JuhvtY=&uniplatform=NZKPT&language=CHS

126. Rong Y. L. (2016). Research on marketing management strategy of LY Real Estate Company (Master's thesis). University of Electronic Science and Technology of China, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNo_D7fWc67U2DUaN3gjzRLtBGBsma25c0HdlQJ81XqEysymm2wmmkWH6tD0JoW3mqUKbXICCsu8_8CU85i0fqLI9A0Fo3JKuU6M92gmPnilwPiYPPhGsY_jvBim4R9ldrLBCOlbD0481IIjzOPkZJa6RWGJcxXheg=&uniplatform=NZKPT&language=CHS

127. Zhang C. (2016). Research on sales management and improvement scheme design of Oriental Yuhong Group-W Company (Master's thesis). Nanjing University, China. URL: https://link.cnki.net/doi/10.27235/d.cnki.gnjiu.2016.000206

128. Gao L. L. (2016). Research on channel marketing performance evaluation of real estate enterprises (Master's thesis). Chongqing University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVM-hxHzQ7AIaERdw0xzGWnjd8jGMy7hKiiuAE4HDpw00QcI3LOime7lajHQjYEsye8mPpo8-qJk9WxlGTpYA8FA_gdNKSzVLmrfDQYIJxTDQ9mWDjAIs3hZGZhswBc2ekA_aQ9utj_EIGKn2CHJoK_QL6aj3WVKX0Q=&uniplatform=NZKPT&language=CHS

129. Wang T. (2017). Research on key account marketing strategy of L Company (Master's thesis). Wuhan Textile University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVOMWz6v4dgszZaWPeJVXx4TTesxaNzXdlTZnZ0DDPeZvdwP_DezxdVdWGcMrwzzwUk-5TILch-NtfAzSMHpBJ-W0poZnVrj9dADpS7qojrQvPX8i0nJNhFFIArlprzBwR6MbCbKH6QWVu9Dnxd-Q8Z6kuBZamN0_no=&uniplatform=NZKPT&language=CHS

130. Zi H. M. (2018). Research on fine-grained management of real estate groups (Master's thesis). Jilin University, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVO3Ggj3V-H31dq5WDyt-s9EEMW5pHjYPYomFsbBY-xhHcI_IHfz_e2h_79EfE5ctXCbUNQ0WSzxHcNodw4tIP7t0Y37D5_hS3DsQJwKiRLKJnKVsl-AzUEtIcstGkTecBtCHzACCT0AtSu93vW4NCG5XuFoLwMcP3Q=&uniplatform=NZKPT&language=CHS

131. Huang F. Q. (2019). Research on project-based management of enterprise sales work (Master's thesis). Guizhou University of Finance and Economics, China. URL: https://link.cnki.net/doi/10.27731/d.cnki.ggzcj.2019.000305

132. Liu M. (2019). Research on optimization of marketing strategy of A Commercial Real Estate Company (Master's thesis). Nanjing Normal University, China. URL: https://link.cnki.net/doi/10.27245/d.cnki.gnjsu.2019.002277

133. Zhang L. R. (2020). Research on marketing strategy of real estate projects based on 4C theory (Master's thesis). Guangdong University of Technology, China. URL: https://link.cnki.net/doi/10.27029/d.cnki.ggdgu.2020.000779

134. Tang M. (2021). Research on organizational structure optimization of Yunnan SL Real Estate Company (Master's thesis). Kunming University of S

cience and Technology, China. URL: https://link.cnki.net/doi/10.27200/d.cnki.gkmlu.2021.002169

135. Liu Z. W. (2022). A sharp tool for real estate enterprise management upgrading: Practice of OKR in CIFI Holdings. China Real Estate, (2), 55–59. URL: https://link.cnki.net/doi/10.13562/j.china.real.estate.2022.02.008

136. Xia J. H. (2025). Research on optimization of new media marketing strategy for JF Shuxiangfu Residential Project (Master's thesis). Chongqing Technology and Business University, China. URL: https://link.cnki.net/doi/10.27713/d.cnki.gcqgs.2025.000500

137. Song W. W. (2016). Problems and improvement suggestions of internal control in real estate development enterprises (Master's thesis). Capital University of Economics and Business, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVPckK9NaooPirR1qHjgGTD6WxVOtPGiKZsxjI_44ERCcTKajwteI7qyVFEURrtNIkRW9VRuz6QVUIqS9WamHowHoFfl0fZ6J52f-kkUJPK_LMSo56QvufQCv7n5qXSUo_1i9vYJqU3ieKQMxR0JfxLFtwdtCjrflII=&uniplatform=NZKPT&language=CHS

138. Liu X. T. (2014). Internal control diagnosis report of X real estate development project business (Master's thesis). Capital University of Economics and Business, China. URL: https://kns.cnki.net/kcms2/article/abstract?v=hUjjRxyvaVNyqM69vOOyYhRNPQLedcsUujDrmhT6mRZyYYNjXWb8qcmEN32r1bAnXmVV1KEmNMoMki4C0BP64aeWHd3RPa3Jfsf3Kwot3dRpOFQFWjteSt4QrOPnoUxBqWqL91T4RIqwsU_GtZ1Gi70owdiiWzYtI0erMYag5bE=&uniplatform=NZKPT&language=CHS

139. Liu T. (2021). Research on performance management problems of sales staff in M Commercial Real Estate Company (Master's thesis). Jiangsu University, China. URL: https://link.cnki.net/doi/10.27170/d.cnki.gjsuu.2021.002562

140. Fadeeva I. G., Orlova N. V., Makarova V. V. Modeling of business processes of an organization: essence, components and implementation methodology in the conditions of formation of a global economy of sustainable devel

opment. *Academic visions*. 2023. Вип.17. URL: http://dx.doi.org/10.5281/zenodo.7730889

141. Lyshenko M. O., Makarenko N. O., Kulyk A. A., Polyvoda V. V. Managing the economic security of an innovation-oriented enterprise in the con text of sustainable development, digitalization, globalization and activation of t he adaptive marketing system. *Formation of market relations in Ukraine*. 2023. Вип. 1(260). С. 105-112. URL: http://dndiime.org/wp-content/uploads/2023/04/1-2023.pdf

142. Lyshenko M., Makarenko N. Theoretical foundations of the marketin g concept of management and formation of a strategy for the development of the enterprise under conditions of sustainability. *Ukrainian Journal of Applied Economics and Technology*. 2023. Volume 8. № 1, pp. 33 – 40.URL: https://doi.org/10.36887/2415-8453-2023-1-5

143. Lyshenko M.O., Makarenko N.O. Theoretical foundations of the mar keting concept of management and formation of an enterprise development stra tegy in conditions of sustainability. *Ukrainian Journal of Applied Economics a nd Technology*. 2023. №1(5). T.8. C. 33-40. URL: https://ujae.org.ua/wp-content/uploads/2023/04/ujae_2023_r01_a5.pdf

144. Lyshenko M.O., Makarenko N.O., Kulyk A.A., Palyvoda V.V. Mana gement of economic security of an innovation-oriented enterprise in the conditi ons of digitalization, globalization and activation of the adaptive marketing syst em. *Formation of market relations in Ukraine*. No. 1 (260). 2023. P. 105-112. URL: https://doi.org/10.5281/zenodo.7787071

145. Lyshenko M.O., Us Y.A. Organizational and economic principles of implementing adaptive marketing at enterprises as a stage of determining strate gic goals. *Bulletin of Sumy National Agrarian University*. 2026. № 2. URL: https://snaujournal.com.ua/index.php/journal/article/view/448

146. Makarenko N.O. Algorithm for implementing a marketing manageme nt system at real estate enterprises. *Effective Economy*. 2024. №11. URL: https://nayka.com.ua/index.php/ee/article/view/5062/5106

147. Makarova V. V., Mushtay V. A. Marketing research of the digital in frastructure of the real estate market of Sumy region. *Modern Economics*. 202 4. № 48(2024). С. 63-71. URL: https://modecon.mnau.edu.ua/marketing-research -of-digital-infrastructure/

148. Orel A. M., Kamnev O. O., Manzhula V. O. Organization and mana gement of strategic development of an enterprise based on a program-target ap proach in marketing. *Successes and achievements in science*. № 10(10). 2024. С. 1131–1139. URL: https://perspectives.pp.ua/index.php/sas/article/view/18102/18 157

149. Orel A. M., Rabchuk S. V. Fundamentals and formation of the clust er concept of the business environment. *Investment Journal: Practice and Expe rience. 2*025. № 7. С. 60–65. URL: https://er.knutd.edu.ua/bitstream/123456789/ 29372/1/Inv%2B7-2025_St9.pdf

150. Orel V.M., Orel A.M. Formation of an effective model of manage ment of innovative development in the sphere of housing construction services. *Successes and achievements in science*. 2025. № 8 (18). С. 1085-1097. URL: https://test.knutd.edu.ua/bitstream/123456789/32440/1/28122-%d0%a2%d0%b5%d 0%ba%d1%81%d1%82%20%d1%81%d1%82%d0%b0%d1%82%d1%82%d1%96-3 8279-1-10-20250901.pdf

151. Sokhan I.V. Main aspects of the marketing policy of real estate obje cts. *Successes and achievements in science*. 2024. №7. С. 537-548. URL: http: //perspectives.pp.ua/index.php/sas/article/view/15011

152. Sokhan I.V., Danko Y.I. Managing the effectiveness of marketing co mmunication interaction of an educational organization with the target audience. *Ukrainian Journal of Applied Economics and Technology*. 2022. Випуск 7. 3 55-361. URL: https://doi.org/10.36887/2415-8453-2022-2-43

153. Sokhan I.V., Popovsky V.G. Formation of competitive advantages as a foundation for strong competitiveness of enterprises. Business Inform. 2023. №2. 236–241. URL: https://www.business-inform.net/export_pdf/business-inform-2023-2_0-pages-236_241.pdf

154. Vynogradova O. V., Shenderivska L. P., Kulyk A. A., Zakusylo V. V. Security management of marketing processes and startups of innovatively or iented service enterprises in the context of digitalization. *Formation of market relations in Ukraine.* 2023. № 7-8. URL: https://doi.org/10.32702/2307-2105.2023.10.20

155. Vynogradova O., Dymenko R., Ignatenko O., Darchuk V., Sovershen na I., & Snitko A. Ensuring financial sustainability with performance marketin g tools.. *Financial and Credit Activity Problems of Theory and Practice*. 2024. №3(56). С. 518–532. URL: https://doi.org/10.55643/fcaptp.3.56.2024.4359 (Ско пус)

156. Vynogradova O.V., Lehominova S.V., Goloborodko A.Yu., Nosova T. I. (2025) Modeling of business processes for managing integrative digital dev elopment of enterprises. *Academy Review*. 2025. № 1 (62) С. 193 – 210. UR L: https://doi.org/10.32342/3041-2137-2025-1-62-14

157. Zhivko Z.B., Makarova V.V., Sukhomlyn L.V., Mysnik A.V. Optimiz ation of management decisions in project management of innovatively oriented enterprises in the service sector in the context of digitalization and security c hallenges. Formation of market relations in Ukraine. Вип. 3 (262). 2023. С. 3 1-37. URL: https://dndiime.org/wp-content/uploads/2023/06/3_20232.pdf

APPENDIX I

Survey Questionnaire 1: Verifying the Optimization Effects of Real Estate Marketing BPM (Customer Satisfaction Survey at the Sales Office)

Dear Customer:

Hello! Thank you very much for visiting the sales office of [Project Name: YunXi/HuGuang]. We are conducting academic research on optimizing real estate marketing service processes, and your feedback will help us improve service quality in the industry. The questionnaire can be completed in just 2–3 minutes, and all answers are open-ended. This survey is completely anonymous, with all information strictly confidential and used solely for academic statistical analysis; it will not be disclosed to any third party. Thank you for your support and cooperation!

I. Identification Question

Question Number	Item	option
Q1	Are you a valid visitor for [Project Name]? (A valid visit means a stay of ≥15 minutes with substantive communication with a property consultant.)	□Yes (continue) □ No (exit)

II. Main Research Questions

Instructions: Please check the corresponding option based on your actual experience during this visit. (Scoring criteria: 1=very dissatisfied; 2=dissatisfied; 3=neutral; 4=satisfied; 5=very satisfied)

Question Number	Item	1	2	3	4	5
Q2	Upon entering the sales office, a property consultant promptly greeted you within three minutes.	□	□	□	□	□
Q3	The reception process for property consultants is standardized, and their services are professional.	□	□	□	□	□
Q4	The property consultant provided clear and accurate answers to your questions regarding project details, unit layouts, and pricing, with no information withheld.	□	□	□	□	□
Q5	The project provides model unit/VR/AR viewing tools that help you clearly understand details such as floor plans, lighting and ventilation, and community amenities.	□	□	□	□	□
Q6	You are satisfied with your overall experience during your visit to the [Project Name] site.	□	□	□	□	□

III. Supplementary Research (Optional)

Question Number	Item
Q7	What do you find most satisfying about this property experience? _____ _____ Which aspect needs the most improvement? _____ _____
Q8	Do you have any other comments or suggestions regarding your visit? _____ _____

IV. Basic Information (for customer segment statistics only; fully anonymous)

Question Number	Item	Option
Q9	Your age range	□ 25 years and under □ 26–35 years old □ 36–45 years old □ 46–55 years old □ 56 years and above
Q10	The number of permanent residents in your household	□1 person □2 people □3 people □4 people □5 people or more
Q11	Your motivation for purchasing this property	□ First-time home purchase for essential needs □ Home purchase for improvement □ Home purchase in a school district □ Investment property □ Other
Q12	Number of property purchases	□ First-time home purchase □ Second-time home purchase □ Third-time or subsequent home purchases
Q13	Have you also visited another property in the East District (YunXi/HuGuang)?	□ Visit this project only □ Visited both projects simultaneously

APPENDIX II

Survey Questionnaire 2: Verifying the Optimization Effects of Real Estate Marketing BPM (Customer Satisfaction Survey for Subscribed Clients)

Dear Property Owner:

Hello! Thank you very much for choosing [Project Name: YunXi/HuGuang] and completing the property purchase contract signing. We are conducting academic research on optimizing real estate marketing service processes, and your genuine feedback will help us enhance service quality in the industry. The questionnaire can be completed in just 2–3 minutes, with all answers being open-ended (no right or wrong answers). This survey is completely anonymous, and all information is strictly confidential; it is used solely for academic statistical analysis and will not be disclosed to any third party. Thank you for your support and cooperation!

I. Identification Question

Question Number	Item	Option
Q1	Have you officially signed the property purchase contract for [Project Name]?	□ Yes (continue) □ No (Stop)

II. Main Research Questions

Instructions: Please check the corresponding option based on your actual experience with this contract. (Scoring criteria: 1=very dissatisfied; 2=dissatisfied; 3=neutral; 4=satisfied; 5=very satisfied)

Question Number	Item	1	2	3	4	5
Q2	The staff provided clear information regarding the entire signing process, required documents, and important considerations.	□	□	□	□	□
Q3	The waiting time for this signing is within your expected range, with no prolonged invalid wait.	□	□	□	□	□
Q4	The staff provided clear and accurate explanations of the core terms of the property purchase contract and the respective rights and obligations of both parties.	□	□	□	□	□
Q5	The property purchase contract you received (including customer information, property, pricing, etc.) is accurate.	□	□	□	□	□

Question Number	Item	1	2	3	4	5
Q6	The calculation of the purchase price for this property is clear and accurate, with no price disputes whatsoever.	□	□	□	□	□
Q7	The payment process and document submission procedures for this signing are convenient and seamless	□	□	□	□	□
Q8	You are satisfied with your overall experience of the entire signing process for [Project Name].	□	□	□	□	□

III. Supplementary Research (Optional)

Question Number	Item
Q9	What do you find most satisfying about this signing experience? _____ _____ Which aspect needs the most improvement? _____ _____
Q10	Do you have any other comments or suggestions regarding the signing process? _____ _____

IV. Basic Information (for customer segment statistics only; fully anonymous)

Question Number	Item	Option
Q11	Your age range	□ 25 years and under □ 26–35 years old □ 36–45 years old □ 46–55 years old □ 56 years and above
Q12	The number of permanent residents in your household	□1 person □2 people □3 people □4 people □5 people or more
Q13	Your motivation for purchasing this property	□ First-time home purchase for essential needs □ Home purchase for improvement □ Home purchase in a school district □ Investment property □ Other
Q14	Number of property purchases	□ First-time home purchase □ Second-time home purchase □ Third-time or subsequent home purchases
Q15	Have you also visited another property in the East District (YunXi/HuGuang)?	□ Visit this project only □ Visited both projects simultaneously

APPENDIX III

Survey Questionnaire Usage Instructions for Verifying the Optimization Effects of Real Estate Marketing BPM

I. Scope of Application:

This questionnaire is applicable to both the experimental group (YunXi) and the control group (HuGuang). During completion, the system will automatically match the corresponding case site names.

II. Research Method:

- Site version: When the client finishes their visit and is about to leave, invite them to scan the QR code on site and complete the form.
- Signed version: After completing all signing procedures and receiving the contract, customers are invited to scan the QR code on-site to fill out the form.

III. Sample Objective:

- Field version: Each group plans to collect ≥30 valid questionnaires per week.
- Contracted version: Each group collects the full number of contracted sets per week based on actual usage.

IV. Criteria for valid questionnaire responses:

- For the identification question (Q1), answer "Yes".
- All subject survey questions are complete.
- Do not select the same option for five or more consecutive questions (this answer will be considered invalid).

V. Data Quality Control:

- Staff are strictly prohibited from guiding customers to select specific options or implying or inducing them to give high scores.
- On-site dedicated researchers will be assigned to distribute and collect questionnaires, ensuring that property consultants do not fill them out on behalf of others.

- Questionnaires collected daily undergo preliminary review on the same day, with invalid responses promptly excluded.
- Ensure that the valid response rates for both questionnaire groups are ≥95%, with the number of responses remaining essentially balanced.
- After completing all data entry, conduct a dual-person cross-check to ensure data accuracy.