

Chapter 2

Literature Review

The researcher has studied concepts, theories and related research used to determine the research guidelines as follows:

1. Real Estate Industry in China
2. Project Management Theories
3. Operations Management Concepts
4. Lean Construction Theory
5. Related research

Real Estate Industry in China

In recent years, the rapid development of China's real estate market has prompted the government to implement various regulatory measures, resulting in a gradual compression of profits within the real estate market. Consequently, the operation and management of the real estate market have garnered increasing attention from industry professionals. The focus has shifted towards optimizing enterprise operation management, achieving business objectives, and subsequently enhancing business income. Geng Baoquan (2014), a domestic scholar, emphasized that the operational body of a real estate development enterprise should consider factors such as department construction, financial management, customer resources, and business processes.

Zhao (2017, p. 55) conducted an analysis of the issues in the daily operation and maintenance management of real estate companies following the implementation of the SAP ERP system. Combining insights from lean production theory, Zhao (2017, p. 55) presented a set of improvement plans covering formalization, production management processes, and data analysis. The adoption of a lean production optimization system aimed to enhance the information flow mode and management team at the production execution level. The closed-loop feedback mechanism facilitated the adaptation of the company's ERP management system to market needs, resulting in continuous improvement and increased accuracy, reliability, and effectiveness of internal data. The production and operation management process of G Company experienced significant enhancements.

Zhang Shanxing (2018) delved into the production plan adopted by a real estate enterprise in the action management and control mode. The study emphasized that the production plan, as a business procedure document, plays a crucial role and is often complex as a strategy. Improving the accuracy of the entire planning cycle, aligning the organizational structure, and reinforcing plan promotion and implementation were identified as key elements in enhancing enterprise competitiveness. Liu Yan (2019) asserted that cash flow management is a critical aspect of the operation and management of real estate enterprises. Often overlooked in production activities, cash flow issues, such as large purchase volumes, unreasonable budget planning, and the absence of cash management system tools, can be addressed through the implementation of a cash flow execution system, accounts receivable cash flow management system, and inventory control mechanisms.

Kong Lili (2019) explored the business management model and observed that real estate enterprises currently underutilize big data tools. Prioritizing big data management was recommended to improve core competitiveness and optimize customer relationship experiences. Zhao Zhen (2019) emphasized the need for real estate enterprises to establish clear strategic goals, gradually improve planning and operation management through scientific business plans, and integrate product standardization and optimized management systems, including the use of ERP systems. When promoting and implementing corporate culture, attention should be given to the combination of product standardization and an optimized management system. Wang Xiao and Yuan Xichun (2018) argued that, given the gradual reduction of land dividends, real estate enterprises are no longer suited for extensive management. Detailed plan operation management, including careful formulation of plans, designation of responsible individuals, definition of quantitative indicators, thorough assessment, and effective information and data management, is essential to achieving corporate strategic goals.

Song Zhonghua and Xu Haimeng (2019) analyzed the operation and management optimization of real estate enterprises from a financial profit perspective. In the context of declining profit margins, leveraging for destocking, based on strategic profit optimization, was identified as a general trend. The design should ensure a scientifically designed organizational structure for the operating system, clear division of power and responsibility, smooth business process planning, and further improvement in operational efficiency and level. Li Xiaowen and Niu Tianyong (2019) studied the operational management of real estate enterprises focusing on risk identification and prevention. They highlighted that business risks are most likely to arise from integrity and revenue

mismatches, operation and service conflicts, brand and quality mismatches, and team instability. Risk mitigation strategies, such as mortgage equity, increased payment ratios, bulk payment of funds, and increased costs, were recommended. Wang Baoyu (2019) conducted an analysis of the main income/profit, marketing cost, management cost, and operating cost of real estate enterprises over the past three years, offering suggestions for improvement. The analysis emphasized the importance of considering overall cost expenditure, conducting market research and implementing coping strategies during the investment stage, and managing costs during marketing to strengthen product management.

Liu Gang (2017) analyzed the capital management of real estate enterprises from a financial perspective, categorizing the capital of real estate operation business into marketing, production, procurement, and financial business funds. Effective allocation of procurement operating funds, improvement of customer satisfaction during marketing activities, and strict control over the proportion of financial management funds were identified as crucial factors in optimizing operational efficiency and profitability.

Project Management Theories

1. Project schedule management

The management of project schedules represents an organizational framework encompassing the realization of operational outcomes and the exchange of technology, resources, methodologies, and information within the domain of project management. Distinct organizational levels characterize project schedule management at various managerial tiers. This includes tactical project schedule management, which incorporates planning, schedule control, cost management, and the tracking of issues, and multifaceted project schedule management, involving risk prevention, risk control, organizational resources, and additional managerial functions. Furthermore, strategic project schedule management integrates business strategy, performance assessment, revenue evaluation, offering comprehensive project management technological functions. Enterprise EPMO (Enterprise PMO) augments these capabilities with cross-management and human resources management functions. In the real estate industry, the nature of project schedule management is contingent upon project hierarchy, primary responsibilities, and project scale. In the contemporary stage of real estate development in China, enterprises with a project management office at its core exhibit higher project management scores and comprehensive inspection evaluations. This underscores the

pivotal role of project management organizations in enhancing the maturity of project management within real estate companies (Leng Xiuyue, 2020).

Annika Zika-Viktorsson, Apery Sandstorm, and Mats Enwall (2006, pp. 385-394) concentrate on the effective management of multiple projects concurrently, delineating fundamental concepts of multi-project management and project group management. They address issues related to resource allocation conflicts and emphasize the coordination of relationships among project team members and the proper deployment of personnel. Consequently, realizing rational and effective human resource management becomes an organizational imperative for addressing challenges in the parallel management of multiple projects.

Mats Enwall and Anna Jerran (2011) delve into the rational allocation of resources amidst multiple project management scenarios. They advocate for the strengthening of control technology in project operations to reduce errors in both planning and execution. They argue for an objective assessment of contradictions in real estate development, emphasizing the necessity to address root causes through improved management practices such as scientific planning, rigorous implementation, and timely feedback. Additionally, adopting more advanced management methods in operational management is recommended to better navigate and respond to complex market changes.

Irene P. Tobey and Michael Tobey propose a research approach that categorizes projects into different levels within an enterprise, providing systematic theoretical support for project prioritization. S. Avisakow and B. Golany (2010, pp. 9-18) suggest adopting a "wait-and-cycle" operational mode to achieve optimal efficiency per unit of time. They advocate for introducing new project controls within the team's tolerable range, thereby requiring waiting beyond the project's scope to allocate resources more reasonably and ensure smooth progress. This approach raises the bar for project quality, emphasizing the need to filter high-quality projects aligned with enterprise needs. Comprehensive analysis and evaluation from multiple dimensions are imperative for selecting excellent projects, enhancing the scientific decision-making of the investment stage, and promoting the efficient allocation of enterprise resources.

A. Siivathanu Pillai, A. Joshi, and K. Inivasa Rao (2019) propose an evaluation method that considers various factors. Based on the enterprise strategy, they subdivide each project into different levels to ensure operational decisions at each stage align closely with overall enterprise development, aiming for optimal comprehensive benefits. Adopting a classification and grading approach safeguards overall enterprise interests while ensuring that the goals and final results of each project meet expectations.

In summary, research on project schedule management in foreign countries commenced earlier, and their management theories are more advanced. Addressing prevalent issues, valuable methods have been put forth, encompassing organizational guarantees, enhanced plan operation management, project classification, and comprehensive control of project numbers. These insights, including refining control granularity and improving investment decision standards, offer valuable materials and references for this research, carrying significant guiding implications.

2. Project priority determination

Project priority entails the company's deliberation when confronted with the task of executing multiple projects and making decisions regarding task priority within a singular project. This involves considerations based on the project's complexity, related issues, resource requirements, benefits, time constraints, and other pertinent factors. Ultimately, through a comprehensive assessment of the benefits and costs for the company, the project and task priorities are determined, establishing the sequence of resource allocation (Hu, 2017).

Chen Ning et al. (2006, pp. 75-79) emphasized the necessity of resolving project priority and related resource allocation to successfully manage multiple projects concurrently. In light of this, they developed a novel resource allocation efficiency model to aid enterprises in adjusting resource allocation according to varying circumstances, optimizing economic benefits. The model serves as a measurable and visual management tool, enhancing the scientific and rational nature of decision-making.

Feng Zheng (2017, p. 64) asserted that enhancing efficiency stands as a pivotal challenge for real estate enterprises, and a comprehensive planning management system is essential for addressing this issue. The effective multi-project planning management method, centered on key nodes throughout the entire project cycle, facilitates the control of task priorities. It is imperative that project priority management exhibits coherence, integrity, and controllability, adopting the Deming cycle management method to maximize efficiency. Furthermore, alignment with enterprise strategy and timely adjustments based on actual circumstances are crucial.

Tan Yuntao and Guo Bo (2012, pp. 151-155) previously underscored the limitations of internal resources, emphasizing the significance of strategic decision-making for new projects. They advocated for the development of a vision, the selection of projects most aligned with the company's strategy and business objectives, and the implementation of a project team grading system.

Jiang Nanjiang and Yu Bin (2011, pp. 83-85) contributed insights from an enterprise strategy perspective by comparing and analyzing the differences in methods and impacts between single-project and multi-project parallel development. In the context of multi-project parallel development, the organizational structure of enterprises serves as the foundation for the timely adjustment of strategy implementation.

Operations Management Concepts

1. Project information processing system

The project information processing system within a real estate company encompassed the comprehensive management of the entire project, spanning the four primary facets of project investment, design, development, and service. It addressed crucial stages in project operation management, including project development (incorporating project demonstration and planning), planning and design, project construction (encompassing procurement, bidding, and construction), and sales and service. The objective was to achieve comprehensive standardization, process optimization, and refinement throughout the project's operations and management. Furthermore, leveraging a management and control model characterized by scientific centralization, decentralization, and proficient functional lines, the overall project's operational and management levels not only directly influenced the final rate of return but also authentically reflected the enterprise's comprehensive management competence (Zhang, et al., 2021).

Zhang asserted that, due to coordination challenges, the functional organizational structure proved suboptimal for managing multiple projects concurrently, resulting in inefficient utilization of human resources in project-oriented organizations. The matrix organizational structure aimed to enhance coordination across functions and facilitate rational allocation of internal and external resources. However, it still exhibited limitations, such as ambiguous responsibility boundaries among project members.

Tan Shukui (2009, pp. 25-26) posited that the primary role of the operations management department lay in schedule control and comprehensive coordination. Emphasis was placed on strategic planning, business objectives, and multidimensional research and analysis of practical issues in project management. This was achieved through establishing an integrated management function responsible for cross-department coordination, overall planning, problem resolution, and full-cycle tracking, thereby supervising the simultaneous operations of multiple projects.

According to Zhou Lianghua (2011, pp. 23-25), effective project planning management necessitated full participation. In managing the project life cycle, it was imperative to clarify functions and responsibilities, define personal accountabilities, articulate all tasks with measurable standards, and conduct reviews to ensure the precise goal-orientation and results.

Liu Xinwei's (2014, p. 85) in-depth analysis of regulatory policies' development in the real estate industry highlighted the significance of planning and design management within the purview of operation management. Multi-project planning and design operation management, when executed effectively, could enhance overall project and company benefits by elevating product quality and cost efficiency.

2. Performance appraisal system

Wang Lei (2016, p. 116) commenced his exploration from the perspective of real estate company business objectives and problem-solving, presenting recommendations for enhancing the performance management system. He extensively employed various performance management methodologies, including the balanced scorecard (BSC), key performance indicators (KPI), and management by objectives (MBO), to formulate an innovative performance management system aligned with the company's strategy. The concept of performance appraisal process management and result evaluation was introduced to establish a comprehensive closed loop of PDCA, aiming to continually enhance the overall company performance. This incentive assessment system exhibited a clearer goal orientation and more refined process management.

Approaching project management, Xie Wei (2012, pp. 31-35) advocated for evaluating the results of the plan implementation process in stages, emphasizing the necessity of maintaining both integrity and accuracy while accomplishing the designated tasks within the plan cycle. Whether pertaining to function or project, business or operation, phased results tracking and evaluation should adhere to established standards to achieve effective parallel plan management. This process control method addressed historical issues of strategy failure and ensured the successful implementation of strategy through a result-oriented approach.

Wang Shengfeng (2014, pp. 74-75) asserted that to effectively preserve and enhance the economic benefits of real estate enterprises, it is imperative to devise a comprehensive assessment index system grounded in their value chain. Yin Shouning highlighted the current significance of "high turnover," "high incentive," and "high efficiency," emphasizing the need to establish a robust mechanism supporting these attributes for ensuring enterprise sustainability. Wang underscored the importance of efficiently

realizing the orderly allocation of resources to achieve cost savings, effective fund utilization, and the creation of superior economic benefits.

Dai Bingkun (2017) delved into the performance management of real estate enterprises, contending that the efficacy of the company's project management system is intricately linked to the enhancement of its performance appraisal and management system. Both components are interdependent and indispensable.

Lean Construction Theory

The early Toyota company is recognized as the pioneer in introducing the lean concept, with its fundamental principle being "excellence." By streamlining processes, enhancing quality to achieve premium branding, and subsequently attracting customers, the core idea of lean production was established. In 1996, James Womack, a professor at the Massachusetts Institute of Technology, formally introduced the concept of lean production in his book "Lean Thinking." Over time, as more enterprises focused on scalability and refined output, the concept evolved and improved in both practice and theory.

As industries continued to integrate and develop, lean production extended beyond the manufacturing sector. Its advanced principles became a reference for various industries and fields, leading to the development of lean construction ideas (Li Rongyong, 2015). Lauris Koskela first introduced Lean construction thinking during a speech at the International Group of Lean Construction (IGLC) conference in 1993. He emphasized that lean construction should prioritize customer demands, achieve value maximization through technical and theoretical innovation, and consider rational resource use and sustainable development. This concept later served as a theoretical foundation for the real estate industry's development, with the hope that it would guide the industry through a transformative process.

With the robust development of the economy, lean thinking has seen substantial growth in recent decades. Representative literature in foreign languages, such as Womack and Jones (1996), highlighted the significance of value creation and the necessity of a solid internal value system for sustained external value realization. Don RanSen (2003) conducted empirical analysis on the application of lean production, showing that enterprises embracing lean ideas often achieved excellent business performance, effective corporate governance, and positive relationships with investors. Rosemary R. Fullerton (2014) built a structural equation model based on extensive enterprise

survey data, demonstrating the correlation between the degree of lean construction implementation and the use of lean strategy models.

In China, scholars have conducted theoretical and empirical analyses, considering the country's unique conditions. Zhou Wujing (2012) argued from a systems engineering perspective, emphasizing the incomparable role of production factors in enterprise production. Zhang Hongliang (2013) shifted the focus to human capital, stressing the indispensable relationship between human capital and production factors. Scholars like Ma Jun et al. (2015), Li Min (2019), Wang Dan (2020), and Zhao Fanglu (2020) further contributed to the discourse on lean construction, addressing strategic levels, real estate industry systems, lean culture building, and development directions for enterprises.

The essence of lean construction lies in being customer-oriented, firmly implementing a people-oriented business philosophy, and creating wealth and value by minimizing costs in terms of manpower, materials, capital, time, and other resources. The primary goal of lean construction is to minimize waste in the enterprise's operational processes, ensuring that every expenditure contributes value to the enterprise.

Related Research

Differences in the policy environment, market conditions, and industry stage exist between the domestic and international real estate industries. Further research and investigation into the current state of concurrent management research of multiple projects in "project management" in China are necessary.

In a study conducted by Xing Yiqun and Zheng Xinyi (2003, pp. 42-45), an in-depth discussion and comparison were undertaken regarding the organizational structure modes commonly employed in real estate enterprises amidst the realistic backdrop of multi-project parallel development. It was observed that the prevailing mode is matrix; however, numerous past cases have demonstrated certain limitations of matrix in multi-project parallel management. They posited that the process-oriented organizational structure can effectively address this issue.

Liu Yufeng and Meng Xuehua (2012, pp. 35-36) highlighted the challenges in the current domestic real estate market stemming from disparities in decision-making and execution levels, an imperfect management system, unclear objectives, limited execution ability, and a lack of process control. They underscored the necessity to strengthen the unified idea of enterprise culture construction, enhance governance structures to meet fine management requirements, and implement standardization

and process improvements. The process improvement mechanism, while ensuring enterprise safety, can continuously elevate the management level by identifying and resolving problems brought about by system transformation.

He Guohai and Chen (2017) proposed the project group management mode through the study of multi-project group management, advocating for dividing projects into groups and managing them as units. The formulation of a comprehensive multi-project parallel management plan is deemed essential to coordinate the interests of each unit, facilitating more effective and precise resource allocation.

In their research on the performance management of multiple project organizations, Yang Xiaona and Zhou Guohua (2020) found that the uniqueness of parallel projects leads to a lack of a scientific evaluation mechanism. They argued for establishing an evaluation system aligned with the development stage, comprehensive strategic positioning, and business objectives of the enterprise.

Du Zhigang (2018) asserted that the plan management system should be enhanced in terms of formulation, execution and control, and evaluation. Empowering the responsible person from the top-down is crucial, and comprehensive consideration of internal and external company situations, historical experience, and lessons should precede plan formulation. Implementation should focus on process control, dynamic management, monitoring, early warning, and corrective measures. In terms of evaluation, a corresponding assessment and incentive system should be established based on the enterprise's actual situation.

Chen Ken (2016) contended that the operation and management of real estate enterprises provide a system guarantee for the product development and sales value chain. Through continuous implementation, control, evaluation, and improvement, the system becomes advanced and accurate, ultimately enhancing project operation efficiency, capital efficiency, and reducing development costs. This leads to the realization of comprehensive competitiveness, maximizing enterprise value and benefit.

In conclusion, the examination of domestic research results reveals that the prevailing focus in enterprise multi-project parallel management centers on the alignment of organizational structure and enterprise strategy, transitioning from matrix to process-oriented structures, enterprise culture construction, corporate governance enhancement, process standardization, project team management, improvement of assessment and evaluation systems, resource allocation, and research and judgment in decision-making. However, there remains a deficiency in systematic analysis and research on how to systematically achieve the parallel large-scale development and

construction of multiple projects in real estate enterprises through planned operation and management.