

A REVIEW OF THE CURRENT STATUS AND PATHWAYS OF COST CONTROL IN SMALL AND MEDIUM-SIZED CATERING ENTERPRISES: FROM A LEAN MANAGEMENT PERSPECTIVE

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Abstract: *As China's catering industry experiences steady expansion, small and medium-sized enterprises (SMEs) play a vital role in market diversification and job creation. Yet, these businesses are increasingly challenged by volatile raw material costs, rising labor expenses, and competitive pressures. Effective cost control has become essential to their continued growth. Many SMEs still rely on traditional, experience-based cost practices, which are insufficient in today's complex market landscape. Lean management, emphasizing waste reduction and continuous improvement, has shown strong potential in service sectors beyond its manufacturing origins. This review draws on lean principles to examine recent studies—both Chinese and international—on cost control strategies in catering SMEs. It discusses the evolution of management approaches, identifies common implementation challenges, and highlights areas where current research falls short. The paper further evaluates how lean management can be practically integrated into real-world catering operations. By doing so, it aims to support SMEs in strengthening cost efficiency and long-term sustainability.*

Keywords: *Cost control, catering enterprises, Lean management*

Introduction

In recent years, China's economic upgrade and transformation, combined with growing urban consumption levels, have impelled rapid growth in the catering industry. As an integral sector in the service industry, small and medium-sized catering enterprises (SMCEs) played the leading role in enhancing people's diets, stimulating local economies, and creating jobs. Their operations—characterized by low barriers to entry, high market responsiveness, and strong adaptability—have made them a prominent presence not only in first-tier metropolitan areas but also in second- and third-tier cities and township communities. However, alongside this expansion, SMCEs face increasingly complex market challenges. Key among these challenges is the rising operational cost burden. Unpredictable raw material costs, rising labor cost inflation, increased rental rates, and heightened regulatory compliance individually eat into margins. At the same time, consumer requirements are evolving fast—moving toward differentiated services, diverse eating habits, and indulgent dining experiences—exerting further pressure on companies to deliver good-quality services at affordable prices. Hence, the ability to exercise proper and sustainable cost control has emerged as a decisive factor in determining the survival and growth of SMCEs.

Traditionally, cost management in SMCEs has relied heavily on ad hoc approaches and managerial judgment. These methods, being convenient and simple, have the tendency to result in inefficiencies, lack of transparency, and ineffective allocation of resources. These are ineffective in today's high-speed environment where there is a need for standard processes, poor financial planning capabilities, and ineffective utilization of data, which further amplify waste and decrease responsiveness to external shocks (Tortorella et al. 2014). In this regard, lean management comes forward as a viable and strategic solution. Emerged first from the Toyota Production System in the mid-20th century, lean management is based on waste minimization, continuous improvement (Kaizen), and optimization of value to the customer. Its principles have been widely utilized in manufacturing, healthcare, logistics, and lately, in service industries like hospitality and catering (Schonberger et al. 2008; Bowen et al. 1998). By employing methods such as value stream mapping, 5S organization, standard work procedures, and real-time feedback systems, companies can streamline processes, enhance the use of resources, and reduce non-value-added activities.

As scholarly and industrial interest in lean management continues to increase, and especially in the case of SMES, this paper seeks to fill a void in the literature by systematically surveying home and overseas studies of cost control in SMCEs from the lens of lean thinking. It aims to (1) briefly summarize the evolution and implementation of lean instruments in small-scale catering environments; (2) explore existing challenges in theoretical research and practical use; and (3) offer valuable recommendations for future empirical research and practical improvement. In doing so, we hope to offer theory foundation and feasible counsel for SMCEs toward increasing cost effectiveness as well as building up sustainable operation capacities under economic volatility and market turmoil Netland et al. 2016.

Literature Review

Definition of Characteristics

Small and medium-sized catering businesses are those service providers with food and beverage activities falling into the small and medium range with respect to number of employees, business turnover, and size of operation. Under China's national standards for the classification of SMEs, catering companies with fewer than 300 employees and yearly income less than 20

million RMB are generally referred to as small or medium-sized. These companies are likely to be owner-managed or family-owned with great flexibility in their organization, quick decision-making, but also with low finances and relatively weak resistance to external shocks. Operationally, these companies are characterized by: Flat organizational structure with low hierarchy; High local responsiveness to customers; Low access to technology and finance resources; Manual operations and on-site decision-making.

In terms of cost control, they often face different issues such as the absence of trained accounting personnel, low levels of informatization, and incomplete financial systems. The majority do not have developed cost accounting systems or employ only basic bookkeeping, resulting in an indistinct source of costs and inadequate reaction to cost changes (Henderson et al. 2000).

The Need for Cost Control

Cost control is a significant way of improving the profitability and overall operational effectiveness of a company. For small and medium-sized catering companies operating on tight profit margins, effective cost control is not just a matter of improving performance—survival is at stake. Effective cost management avoids waste of resources, maximizes the use of staff, and enables a company to respond more effectively to changes in the market.

In particular: Profit-wise, these businesses tend not to have pricing power to shift increased costs to consumers. Reducing costs, therefore, is the most effective means of enhancing net profit. Resource allocation-wise, systematic cost control enables managers to detect inefficiencies in real time and channel resources where they are most efficient. Strategically, the implementation of a structured cost management system creates a basis of long-term competitiveness and facilitates scalability. From the government support perspective towards SMEs, more and more policy efforts focus on digitalization and transparency of finance, and both rely on good cost accounting. In general, cost control is a cornerstone of sustainable development that allows small and medium-sized catering enterprises to weather external shocks, be better able to respond to the needs of consumers, and remain competitive in a more saturated market climate.

Theoretical Foundations of Lean Management

Lean Management is a structured business philosophy and practice that developed from the Toyota Production System (TPS) in the mid-20th century. The management system aims to deliver maximum value to customers with the least resources by finding and eliminating all non-value-added activities. As described in the groundbreaking work *Lean Thinking* by (Womack and Jones et al. 2005), lean is all about "doing more with less" and getting better continuously towards perfection in the delivery of value.

The lean management theory structure includes some key principles: Customer value orientation: The value of the customer should be at the center of all business activities. Anything apart from an immediate activity or process in the support of customer value is referred to as waste. Value stream identification: Organizations study the materials flow and information utilized in producing a product or delivering a service by using tools such as Value Stream Mapping (VSM) and then establish bottlenecks, redundancy, and inefficiencies. Kaizen (daily improvement): Lean is about making small improvements every day. All employees are encouraged to identify inefficiencies and recommend process improvements. Employee empowerment and participation: Employees are considered a source of improvement. By

training and decentralized decision-making, lean systems enable employees to take an active role in solving operational problems. Pull production and just-in-time (JIT): Production and services are fixed by real customer demand, minimizing stock and preventing unnecessary work-in-progress. 5S (Sort, Set in Order, Shine, Standardize, Sustain), standard work processes, Kanban systems, root cause analysis (e.g., 5 Whys, fishbone diagrams), and mistake-proofing techniques (Poka-Yoke) improve the tools of lean. When applied systematically, these tools enable organizations to enhance working efficiency, reduce waste, and improve customer satisfaction.

Although lean evolved from the manufacturing industry, and specifically automotive production, its foundational principles have since been found to be widely transferrable across a wide range of non-manufacturing environments. Over recent decades, industries such as health care, finance, education, logistics, and notably service sectors like catering have found themselves adapting lean thinking in response to growing operational complexity and customer demands (Bowen et al. 1998) [6].

Lean management offers a formal and practical answer to overcoming the shortcomings of ad hoc management for small and medium-sized catering operations. By applying lean principles to kitchen workflow, food preparation, inventory control, and customer service, these organizations can systematically spot and remove waste, standardize procedures, and enhance profitability without or at minimal capital investment. The flexibility and scalability of lean tools also render them extremely suitable for small businesses with limited resources but high flexibility (Bhamu et al. 2014). In this case, lean management is not only a cost control system but also a strategic lever for long-term value creation, enabling small catering businesses to move from reactive problem-solving to proactive system optimization.

Review of Chinese and International Research

Overview of International Research

Foreign research on lean management and cost control began relatively early, with a strong theoretical foundation and extensive applications. Foreign researchers are mainly concerned with the following issues: (1) implementing lean principles in small and medium-sized enterprise operations; (2) examining the flexibility of lean tools in the catering service industry; and (3) constructing lean cost control models to enhance operational efficiency.

For example, Bhamu and Sangwan (Bhamu et al. 2014) conducted a systematic review of the lean tools' potential for implementation in SMEs and concluded that even in resource-constrained conditions, SMEs can implement lean tools successfully in phased and modular ways. Womack and Jones (Womack et al. 1996) emphasized the core concept of lean as it is to eliminate waste and add value to the customer. Bowen and Youngdahl (Bowen et al. 1998) discussed lean service systems and pointed out that restaurant companies could improve efficiency through process standardization and customer-focused flow design. Shah and Ward (Shah et al. 2017) developed a lean maturity model, correlating lean implementation levels with cost saving and efficiency improvement. In practice, multinational companies and fast food chains such as McDonald's and Starbucks have widely applied lean principles within their kitchen processes, customer service, and inventory management to save costs and enhance consistency in service.

Overview of Chinese Research

As compared to foreign research, domestic research on cost control in small and medium-sized catering enterprises tends to be scattered and primarily focused on three aspects: cost accounting methods, budgetary control systems, and performance evaluation mechanisms (Hines et al.2004;Netland et al.2016). The majority of research emphasizes establishing a sound financial system and using traditional accounting tools such as job costing or standard costing to monitor cost levels. But these methods tend to be insensitive to changing operating conditions and are not suited to real-time decision-making.

In the last few years, as lean thinking has increasingly found application in China's service industries, researchers have begun examining the prospect of lean tools in the food service industry. While some studies aim at 5S management and its implications on restaurant cleanliness, food safety, and employee efficiency, others use PDCA (Plan-Do-Check-Act) cycles to examine how continuous improvement can streamline kitchen operations and reduce waste (Tortorella et al.2014).

For example, a study on 20 small and medium-sized catering companies in Jiangsu Province was able to prove that the application of lean tools such as value stream mapping and Kaizen events reduced unnecessary ingredient wastage and labor scheduling by quite an extent (Chen Zhiyan et al.2014). Empirical evidence has also shown that the application of ERP systems along with lean principles can help reduce costs considerably and provide greater cost transparency and accuracy in forecasting (Zhang Hongqin 2011).

However, domestic studies are still confronted with various challenges. First, the sample sizes of these studies are comparatively small and thus impede the generalizability of the results. Second, most studies are case-based in nature and inadequately employ quantitative analysis. Third, few studies have established localized models that are specific to the specificities of Chinese catering SMEs. Consequently, there is still much scope for theoretical development and empirical testing in future research.

Application Paths of Lean Management in Cost Control

Application of Value Stream Mapping (VSM) in Process Improvement

Value Stream Mapping (VSM) is arguably the simplest but most effective of the lean management techniques. VSM allows catering firms to achieve an overview of their business by charting the entire work flow from raw material procurement to final food delivery. VSM delineates value-added activities from non-value-added ones, such as excessive processing, redundant storage, idle waiting, or unnecessary transportation. For small- and medium-sized restaurants, where fewer resources increase the expense of inefficiency, VSM is especially helpful.

Through VSM, managers can identify specific bottlenecks, whether redundant handling of ingredients, wait times between kitchen stations, or needlessly complex order assembly procedures. This enables data-driven redesigns of workstations, procurement timing, and kitchen layout. For example, a fast-casual restaurant might discover that its salad station is a bottleneck at peak hours due to ineffective placement of ingredients—VSM can illuminate this shortfall and spur workflow reconfiguration. Furthermore, VSM promotes cross-functional collaboration, with chefs, procurement staff, and front-line servers collaborating to analyze and resolve process inefficiencies (Shah et al.2017).

Implementing 5S Management for Operational Orderliness

5S management—Sort, Set in Order, Shine, Standardize, Sustain—is renowned for imposing visual order and discipline on workplaces. In food-service operations, especially in cramped or high-turnover kitchens, the visual and procedural clarity 5S imposes can have a direct impact on operational safety, quality, and efficiency. "Sort" refers to the removal of unneeded utensils, expired supplies, or seldom-used equipment, removing clutter from work areas and reducing confusion. "Set in Order" requires everything—from condiments to ladles—to have a labeled, designated place. This saves time searching for things and reduces the risk of cross-contamination. "Shine" insists on cleanliness, which is extremely important in food prep areas for sanitation as well as morale. "Standardize" establishes standard procedures for cleaning, inventory checking, and restocking, and "Sustain" enforces discipline through regular audits and employee accountability.

5S is particularly valuable for small kitchens where even minor spatial inefficiencies will disrupt workflow. 5S implementation has been linked to reduced prep time, fewer workplace injuries, and faster task completion—all of which control costs and improve productivity (Bowen et al. 1998) Tortorella et al. 2014.

Standardized Work as a Tool for Operational Consistency

Standardized work means to define and record the best-known way of doing a task so that every employee performs the task in the same order, using the same tools and quality requirements. In catering businesses, where experience levels are mixed and labor turnover is high, standardized work minimizes variation, facilitates quick onboarding, and delivers product and service consistency. For example, standardization of recipes, portion controls, and plating guidelines can prevent overuse of ingredients and restrict wastage. Similarly, front-of-house operations—such as greeting customers, managing payments, or clearing tables—can also be standardized for better customer experience and to restrict gaps in service. Restaurants can incorporate these standards into daily routines through checklists, visual reminders, and on-the-job training.

Importantly, standardized work also gives a solid foundation for future improvements. When everybody is performing a task the same way, it is simpler to identify inefficiencies and propose changes. This translates into long-term cost control, improved customer satisfaction, and more consistent business performance (Henderson et al. 2000).

Continuous Improvement (Kaizen) Mechanisms

Continuous improvement, or Kaizen, is the heartbeat of lean thinking. It demands incremental, step-by-step improvement founded on employee-driven change at all levels, especially those near the work. In catering SMEs, where hierarchies are flat, Kaizen naturally finds a place in the daily routine. Suggestion systems, regular team meetings, and the involvement of kitchen and floor staff in problem-solving exercises build ownership and participation. Common applications include simplifying prep station setup, adjusting food batch sizes to reduce waste, and enhancing order communication from front-of-house to kitchen. Periodic Kaizen events—brief focused workshops—can be targeted at specific issues such as late deliveries or long queue times. Such events promote teamwork and empower workers to provide actionable ideas. In the long run, this open culture creates cumulative cost savings, morale, and innovation (Schonberger et al. 2008).

Integrated Cost and Performance Management Systems

To enable responsive and real-time cost management, catering SMEs are combining lean principles with digital technologies. Holistic performance dashboards connect financial, operational, and customer data to give managers a comprehensive view of cost drivers and efficiency bottlenecks. For instance, POS systems might capture sales by menu item and align them with ingredient usage data from ERP systems. Kitchen display systems (KDS) might capture prep times, and sensors might monitor utility consumption. Such streams of information allow managers to monitor labor productivity, food waste levels, and energy intensity on a real-time basis. Whenever aberrant trends arise—unexpected prep time or waste level increases, for example—corrective actions can be taken immediately. These systems support lean's goal of building feedback-intensive environments and enable cost initiatives to be constantly improved. They also enable benchmarking across sites so that best practices can be replicated chain-wide and underperforming units determined Womack et al.2005(Zhang Liping 2015).

In summary, lean management offers catering SMEs a coherent, practical toolkit to enhance cost control, standardize operations, and build an improvement culture. Digitally supported and well adapted, these methods can unlock significant improvements in efficiency, service quality, and financial performance.

Research Limitations and Future Directions

Current Limitations

Although existing local research has developed a baseline comprehension of lean management's potential in addressing catering SMEs' cost control, there are several key limitations: Sample size limitation: The majority of the research leans heavily on single-case studies or small-scale samples, which undermines the external validity and generalizability of their findings. Most studies concentrate on a single or double case, often selected for their cooperation or exceptionally successful lean implementation, thus including positive reporting bias. This restricted sampling cannot represent the diversity of operating models, geographical spread, and organizational maturity in the broader small and medium-sized catering company population Netland et al.2016Tortorella et al.2014. Without representative samples of larger size, it is not possible to determine whether observed findings represent general trends or context-specific exceptions. Methodological monodiversity: The current research in this field is predominantly qualitative in nature. Although case studies, expert interviews, and field observations give detailed insight into process flows and managerial perceptions, they hardly use triangulation with quantitative methods. There are few statistical modeling, longitudinal designs, or control group comparisons to stringently test lean practice efficacy. Thus, causal inference is weak, and authors can't draw strong conclusions about the association between lean adoption and noticeable cost performance or productivity improvements. The absence of mixed-method approaches reduces the validity and richness of current findings.

Lack of empirical evidence: A high proportion of the literature is either theoretical or descriptive, focusing on conceptual models or anecdotal reports. While such contributions are useful for establishing baseline knowledge, they are not empirically substantiated by systematic data collection or hypothesis testing. For instance, studies tend to argue the anticipated benefits of 5S, value stream mapping, or PDCA cycles without tracking their implementation outcomes over time or securing actual performance data in terms of cost savings percentages, cycle time reduction, or customer satisfaction ratings. Such a theory-data gap weakens the applicability of research findings to practice. Incomplete performance measurement systems: Another major

limitation is incomplete, multidimensional evaluation frameworks. Most studies neither propose nor utilize robust indicators to assess the success of lean management programs. Performance measurement is typically restricted to general claims such as "improved efficiency" or "reduced waste" that are not precise and comparable across environments. Furthermore, most studies fail to assess downstream effects of lean—such as employee engagement, service quality, or brand competitiveness—that are critical for value creation in the long term. Without a specified, data-driven performance mechanism, it is difficult for business organizations to monitor improvement or justify the investment in resources required to enable lean transition.

Insufficient consideration of contextualization: Most existing literature adopts an approach of "copy-and-paste" in applying lean models from manufacturing industry or multinational service firms to Chinese catering SMEs without adequate consideration for adaptation. This overlooks the unique characteristics of SMEs in the domestic setting, including informality of management, low rates of technological adoption, high staff turnover, and regional cultural variations. Prescriptions that work for formal corporate environments can be impossible or useless in smaller businesses with fewer resources and less stringent controls. As a result, a lot of the proposed strategy remains abstract and difficult to operationalize. Future research must consider localized variables—i.e., urban-rural divide, local consumption habits, and regulatory frameworks—in formulating frameworks and recommendations for lean cost management in the Chinese catering context.

Future Research Directions

Developing localized lean performance measurement systems: Future research must attempt to construct multidimensional measurement frameworks that are expressly tailored to the operational realities of Chinese catering SMEs. These systems need to go beyond financial indicators and incorporate metrics on workflow efficiency, customer retention, food waste reduction, and labor productivity. For instance, incorporating measures such as customer wait time, order accuracy rate, inventory turnover, and staff utilization can provide a comprehensive view of lean implementation success. Localization also requires adapting existing evaluation models to fit region-specific constraints such as supplier unreliability, informal labor practices, and divergent foodways (Cheng Dong et al.2001). The ultimate goal is to enable these companies to monitor, assess, and improve lean efforts based on a uniform and actionable dashboard of key performance indicators.

Extending empirical work to large samples: Empirical studies that go beyond case studies and tap into broader datasets are desperately needed. Future research should involve multi-site surveys of diverse geographic settings, business types (e.g., quick-service restaurants, street vendors, food courts), and operation scales. With statistically representative samples, generalizable trends can be uncovered, previous theoretical claims can be tested, and the true effect of lean interventions in real-world settings can be ascertained. The incorporation of panel data or time-series designs will also allow performance trends to be tracked before, during, and after lean implementation and, in the process, strengthen causal arguments and policy implications.

Integration of digital technologies with lean principles: As the catering industry continues to be more digitized, there is a need to examine how the lean principles can be embedded within or facilitated through digital platforms. Future research could examine the nexus of lean thinking and digital technologies such as ERP systems, point-of-sale data analysis, AI-powered

inventory management, and IoT-enabled kitchen monitoring. For example, digital technologies have the potential to automate segments of value stream analysis, real-time responsiveness, and predictive scheduling and maintenance. Understanding how digital ecosystems facilitate or hinder lean transformations will have actionable implications for SMEs undergoing digital transformation while seeking to attain cost control through lean.

Fostering cross-disciplinary methods: Lean management cannot be taught in isolation. Future research can be enhanced by tapping into the knowledge and tools of behavioral economics (e.g., incentive design, nudging behavior), data science (e.g., machine learning-based prediction), and operations research (e.g., queueing theory, simulation modeling). Such interdisciplinary pairings will enable richer modeling of the impact of lean and offer more incisive diagnostic tools. For example, researchers can simulate various staffing scenarios under lean labor allocation policies or apply predictive analytics to estimate the ROI of lean investments in various cost categories. **Analyzing long-term effect and scalability:** Most existing research provides a snapshot view of lean implementation, with little attention to its sustainability or scalability. Future research must conduct longitudinal studies that follow companies over the course of months or years to ascertain whether lean benefits are maintained, erode, or evolve with time. Research is also required to see how successful lean implementations in one store or location can be transferred to other locations in a restaurant chain, considering constraints such as local supply chains, labor capabilities, and managerial bandwidth. Scalability research will help determine whether lean programs remain effective beyond pilot projects and how they can be institutionalized across a widening organizational footprint.

In conclusion, lean management offers promising directions for cost control and operational improvement in small and medium-sized catering firms. To realize its potential, however, scholarship must move beyond theory and case description in favor of stringent, evidence-based research that speaks to the unique conditions of the local business context.

Conclusion and Implications

Cost control has evolved from an afterthought in strategy to a core strategic imperative for small and medium-sized catering companies operating in a cost-sensitive and competitive environment. With diminishing profit margins and rising customer expectations, the ability to optimize cost structures without compromising service quality has emerged as the key to long-term survival. Traditional cost control methods, based primarily on experience or guesswork estimates, do not usually possess the precision, scalability, and responsiveness required in modern business. This makes necessary the significance of more scientific, data-driven, and process-oriented approaches, especially crucial at present. This paper attempted to examine lean management as a new paradigm in addressing these issues. By studying both domestic and international literature, we observed that lean tools—value stream mapping, 5S visual control, standard work procedure, and continuous improvement cycle—could be effectively applied to the catering sector, as variable as it is and as intense in customer contact. In SMCEs specifically, with limited capital and flat organizational structures, lean's emphasis on simplicity, waste reduction, and frontline empowerment makes it all the more.

However, our own analysis also reveals persistent gaps in current research. Locally, most studies are still case-study based and lack empirical generalizability. There is still too little evidence on the long-term effects of lean initiatives' performance in the catering sector, and theoretical frameworks that are focused on the specific Chinese SMCEs' nature are still

underdeveloped. Moreover, the integration of lean thinking and digital technologies, such as ERP systems, mobile ordering apps, and intelligent stock management, is in its nascent stage. Future success in lean implementation in catering SMEs will not only be based on tool selection but also on strategic congruence, organizational commitment, and employee participation. Managers will be required to move beyond surface-level adoption and instead embed lean philosophy into the DNA of their organization—creating internal champions, establishing feedback loops, and continually measuring performance against established metrics. No less important is the establishment of training programs, digital competences, and supportive policy cultures which equip SMEs to embrace lean without the costs of transition. To policy makers, the message is clear: the support for lean transformation in SMEs has broad benefits for industry modernization, customer satisfaction, and jobs stability. The government and trade associations should offer money inducements, consultancy help, and demonstration pilots that decrease entry costs and raise sector awareness.

In conclusion, lean management not only provides a tactical set of tools for reducing costs but also a strategic view for building adaptive, learning organizations. As small and medium-sized catering companies endeavor to build resilience in an unstable economic climate, embracing lean thinking will be vital to enhance their operational competence, customer value creation, and long-term competitiveness.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Author Contributions

Tao Xin was responsible for the conceptualization, literature review, data collection, and the initial drafting of the manuscript. Dr. Lee Khai Loon supervised the research design, provided critical revisions, and contributed to the methodological structure and final editing of the paper. Both authors have read and approved the final manuscript.

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