THE EFFECT INFLUENCING TOTAL QUALITY MANAGEMENT
IMPLEMENTATION SUCCESSFULLY IN THE CONSTRUCTION PROJECTS
OF SMALL AND MEDIUM-SIZED ENTERPRISES IN KUNMING,
THE PEOPLE'S REPUBLIC OF CHINA

By

Miss Kaixiang SHI

A Thesis Submitted in Partial Fulfillment of the Requirements
for Master of Engineering ENGINEERING MANAGEMENT
Department of INDUSTRIAL ENGINEERING AND MANAGEMENT
Silpakorn University
Academic Year 2023

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรวิศวกรรมศาสตรมหาบัณฑิต
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Title	The Effect Influencing Total Quality Management Implementation Successfully in the Construction Projects of Small and Medium-Sized Enterprises in Kunming, the People's Republic of China
By	Miss Kaixiang SHI
Field of Study	ENGINEERING MANAGEMENT
Advisor	Noppakun Sangkhiew, Ph.D.

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Miss Kaixiang SHI : The Effect Influencing Total Quality Management Implementation Successfully in the Construction Projects of Small and Medium-Sized Enterprises in Kunming, the People's Republic of China Thesis advisor : Noppakun Sangkhiew, Ph.D.

The purposes of this research were (1) to study the importance level of implementing total quality management and success in construction projects of SMEs, (2) to study the effect influencing total quality management implementation successfully in the construction projects of SMEs, and (3) to study a model of the success in construction projects of SMEs in Kunming, China. The sample group is 384 people owners of businesses and managers who have experience doing construction projects for SMEs for more than 3 years. The research tool was an online questionnaire. Data were analyzed using descriptive statistics to find percentage, mean, standard deviation, and Inferential statistics with Multiple Regression Analysis by the Enter section technique.

The results found that all factors were deemed highly important. First, continual improvements had the highest mean at 4.54, followed closely by measurement of performance at 4.51. Employee empowerment and satisfaction received a mean of 4.32, while customer/supplier relationships and process involvement received a mean of 4.30, and 4.28, respectively. Co-operation and teamwork received a mean of 4.18, while continual learning and training and effective communication both received a mean of 4.16. Improved customer satisfaction received a mean of 4.14, and management and leadership commitment had the lowest mean at 4.13.

According to the results of multiple regression analysis findings, employee empowerment and satisfaction, have the highest impact on success in construction projects. Followed by cooperation and teamwork, customer/supplier relationship, effective communication, process involvement, measurement of performance, management and leadership commitment, and continual improvement significant at 0.10. Continuous learning and training, along with improved customer satisfaction, did not have a significant.

In a successful model for construction projects, there are eight key factors that should be given priority. These include employee empowerment and satisfaction, cooperation and teamwork, effective communication, customer/supplier relationships, process involvement, performance measurement, management and leadership commitment, and improved customer satisfaction.

ACKNOWLEDGEMENTS

The research title was the effect influencing total quality management implementation successfully in the construction projects of SMEs in Kunming, the People's Republic of China.

After carefully analyzing the data, the researcher followed their study plan to successfully complete the studies as previously outlined. Thanks to the invaluable support and guidance provided by Associate Professor Dr. Choosak Pornsing, the advisor, who generously shared their insights, knowledge, and useful suggestions, this research was completed with great success. The researcher is immensely grateful for their invaluable help and support.

I would like to express my gratitude to Mrs. Tengjiao Tu for her generous support in promoting education in Thailand. I also want to thank my roommates for their assistance and valuable insights during my research. I am deeply grateful to my parents and family members for their unwavering support and for enabling me to pursue my academic goals at this university. Lastly, I hope that this research will be beneficial to relevant organizations and individuals who wish to delve deeper into this topic.

Kaixiang SHI

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CHAPTER 1
INTRODUCTION

1.1 Motivation

The construction industry plays an important role in the development of the country. Expectations of construction stakeholders growing rapidly due to the rich nature, understanding, and quality consciousness of the clients, and construction companies actively seek internationally accepted quality adoption levels to ensure their sustainability (Oyedele et al., 2015). Both in the economy and society of many countries, it is an industry that creates the necessary infrastructure for the development of the country, especially in public services, in addition to improving the quality of life, and people's lives, facilitating and supporting the development of other industries. In fact, it is the main growth engine of other economic sectors in the development of the country (Khlaifat et al., 2019).

The basis of every country's development lies in its construction projects. especially in terms of transportation infrastructure and public utilities of each country. In addition to improving the quality of life of the people, it also facilitates and supports the development of other industries, such as express transportation business, tourism business, and other service sector businesses that result in resource mobility of raw materials and equipment to support operations and livelihoods for better living (Hajiani et al., 2018). Consequently, construction management and engineering play an important role in global economic growth. The results in the cost-effective use of resources and use of knowledge or innovation to support efficient work There is a job gap for many professionals to foster a competitive business (Musarat et al., 2020).

China's actual property zone is presently developing between 18% and 30% of GDP. A greater correct measure would possibly be round 23% except for infrastructure, which money owed for 7% of GDP, no longer covered with actual property offerings (which is now not protected in the country's closing demand gauge), which will lead to about 18% of GDP (CaixaBank Research, 2022). The relationship between the construction industry and the economy as a whole is determined by three characteristics of the industry: government customers; The larger

market size and expanded investment potential and products are the main source of both direct and indirect employment generating income and stimulating the Chinese economy. As a result, people have a better quality of life (Amoa-Abban and Allotey, 2014)

The construction industry is one of the industries that has a high growth rate and plays an important role in the development of the country. But there is still a lack of development, and finding ways to seriously increase the potential of the construction industry. In order to apply methodologies and procedures of the construction process systematically in construction management for the benefit of quality cost control, and more efficient of operation. Traditional construction methods have disadvantages in terms of production and marketing because they are based on skilled labor, which is one of the reasons that the capability of increasing productivity, limiting the wastage rate of materials, time, and labor is high, and management is difficult to achieve tightness.

Therefore, entrepreneurs need to find ways to adapt to the major construction industry. It will focus on proactive strategies in both operations and investment. In terms of operations, it will focus on reducing costs and enhancing price competition. To increase the opportunity to get jobs from government projects and large projects of the private sector. The large ones have the advantage of having high bargaining power with construction material producers/traders. Including finding continuous business channels from construction contracts to maintain income and profit base, such as the management of the electric train system.

The investment will focus on increasing investment in machinery with technology to replace labor, to reduce the risk of labor shortage including the impact of social distancing measures which is expected to continue for a while for small and medium enterprises. Most of them are developed from family management. With limited funds, This word cannot be subject has lower bargaining power. Some operators will subcontract from major contractors. Especially large government projects, including looking for ways to increase revenue from the repair and improvement of buildings. Private construction contractors in the group living in

general building high rise building and large buildings income tends to recover slowly (Kenpanan, 2020).

Wickramarachchi et al. (2009) found that the classification of quality assurance and total quality management was found to be the leading quality management system used in the construction industry. Customer satisfaction through continuous operational improvement and innovation is applied in all business processes. The views of Jaeger and Adair (2016) also mention that total TQM increases customer satisfaction. Increased quality output, increased quality of products or services, added value, and have the ability to compete in the long run due to better innovation opportunities. This is the benefit of applying the TQM system throughout the organization.

The importance of total quality management implementing successfully in construction projects introduction of the theory of quality management and the quality chain was proposed by Porter (1980) an American quality management expert. He believes that quality management exists to guarantee the dependability and effectiveness of product quality, allowing it to meet production requirements, according to the quality chain theory, quality is an organizational system and the link between all links in all organizations. Starting from the four links of production, procurement, production, and consumption, quality forms a series of interconnected wholes within the organization.

Quality is the link between companies and consumers. Product quality is the competitiveness of products in the market, while service is determined by service. In order to realize the quality target of the enterprise, it is necessary to strengthen quality management, must improve product quality, and enhance product quality. So quality management is an indispensable link in the production process. In order to ensure that the product quality achieves the expected effect, it is necessary to constrain it by establishing a scientific and reasonable quality control system, so that the quality problem can be transformed into sustainable economic benefits. For suppliers, if there is no good quality awareness, it is difficult to ensure quality control, and it is impossible to guarantee product quality. Therefore, we should constantly improve our

own quality system and formulate a more complete quality control system to ensure product quality (Yusof and Aspinwall, 2000).

Many construction projects on companies have a serious phenomenon of weak quality awareness. In particular, some small and medium-sized enterprises have a low level of development due to a lack of professional talents and insufficient capital investment. These situations will not only cause economic losses to the company, but also It will also affect many factors such as the decline in the competitiveness of the overall construction industry.

This is more large construction companies are enthusiastic about the idea of focusing total quality management. In construction project management organizations, many companies have regarded total quality management as an advanced stage in the quality management system. The implementation of TQM can not only improve the quality of construction projects but also work better within the organization, the performance of the organization, but companies are not fully aware of the importance of the project. The implementation of TQM for businesses, due to their lack of vision and comprehensive management, and management, commitment of leadership, enhancing customer satisfaction, continuous improvement, collaboration and teamwork, and continuous learning and training or planning management and execution planning and execution total quality.

At present, many scholars have conducted research on the concept of quality management, the way of TQM, the means of total quality control in organizations, and the measures to improve quality. From a theoretical point of view, the problems of construction quality management and the diagnosis of quality defects (Jaeger and Adair, 2016), and carry out quality factor diagnosis, quality control, target management, and quality improvement. Through quantitative analysis, the problem can be analyzed qualitatively. However, we found that quality inspection procedures in most industries are analyzing and researching quality inspection results on construction sites. It focuses on the overall quality of the project and can find solutions to solve problems effectively. In order to meet the goals in the work set.

Whether it is the time it takes to complete the work, the cost of construction projects. Contractors should use scientific and effective methods to analyze each

phase of the project process and identify any issues that may arise in order to ensure customer satisfaction. They should then provide appropriate solutions to address these problems and implement measures for improvement. This is especially crucial for contractors working on mixed-use projects, as the demand for such projects is expected to increase in the future.

In addition, large contractors have the opportunity to undertake construction work in the private sector in neighboring countries, especially residential projects. The commercial building and industrial plants which will expand investment increased in accordance with the economic recovery trend for small the total revenue tends to decelerate due to the slow recovery of small construction projects. The coupled with cost management limitations, this group of contractors may be at risk of operating results and financial liquidity problems (Krungsri, 2021).

Therefore, The reason for study this research is because the success of the construction project plays an important role in the country's economic development, by the successful completion of the project. The company aims to provide long-term employment opportunities for people in this area, leading to an improved quality of life. Additionally, the company will work on developing strong internal and external networks to ensure the production of high-quality products and services, while making efficient use of resources within the region. In the long run, these sustainable operations will help to ensure the company's continued success. It can be measured in three key metrics (time, cost, and quality). Many researchers consider performance oriented to operational costs. Project implementation on time duration and the quality of the construction work as variables to measure the success of the project (Meredith et al., 2017). These parameters are called "Iron Triangle" that the project manager and the team work have used as a principle for continuous construction management. Although often criticized, but it is still the gold standard for measuring project success (Papke-Shields et al.,2010).

It has been observed that some steel mills and distributors in China are selling their products at higher prices. This, combined with a slowdown in the real estate sector, has caused an increase in the costs of construction projects. The participation process of those involved in the supply chain of construction projects is not meeting

the intended goals, leading to reduced success. As per the forecasts by Oxford Economics (2023), total construction work is expected to decline by 5.4% in 2023 and 2.6% in 2024.

This research firstly clarifies total quality, makes assumptions and surveys according to the definition and literature, in order to discover the methods and expected goals of total quality management in construction projects, and discusses the importance of the successful implementation of total quality management in construction projects.

1.2 Research Questions

1.2.1 The importance of implementing total quality management and successful construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China in the past?

1.2.2 How is the effect influencing total quality management implementation successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China?

1.2.3 To find a model of successful construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.3 Research Objectives

1.3.1 To study the importance level of implementing total quality management and success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.3.2 To study the effect influencing total quality management implementation successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China

1.3.3 To study a model of the success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.4 Research Scope

The studies on the effect influencing total quality management implementation successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China. The study can be classified into 4 aspects as follows:

1 4.1 The scope of the population is the people who are operators of construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.4.2 The scope of content is to focus on implementing total quality management, and successfully in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.4.3 The area boundaries of research defined the area in this study as construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.4.4 Scope of time data collection between May 2023 and December 2023.

1.5 Expected Results

In this study, the researcher classifies the results expected to receive 3 issues as follows:

1.5.1 To know the results of the importance level of implementing total quality management and success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.5.2 To know the results of the impact of implementation total quality management successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.5.3 To results of a model of the successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

1.6 Research Contributions

1.6.1 The construction business entrepreneurs can use research data to plan their operational strategies for long-term competitiveness.

1.6.2 The government agencies that promote construction projects of SMEs will use the results of the research to plan investment promotion strategies to support China's grassroots economy.

1.6.3 A new mode of success in construction projects of small and medium-sized enterprises delivery.

1.7 Definition of Terms

Construction Projects mean *a site or project that is under development through* the organized process of constructing, renovating, or *demolition,* refurbishing, retrofitting, or adapting a building, or other built asset such as a tunnel or bridge.

Total Quality Management Implementation refers to the way in which management and employees operate a construction project. Emphasize the participation of all members in the development or continuous improvement of the production of goods and services. It is a combination of operational quality and management tools aimed at creating added value with suppliers. In order to grow the business and reduce the loss. Due to wasteful practice Including giving importance to customers as a priority.

Success Factors on Construction Projects Success factors in construction refer to the elements or factors that are critical to the achievement of the business vision. Which causes an impact on business operations, by emphasizing the work of participation of all members, and can be divided into 2 types: macro; external-related factors, and micro; quality-related, cost-related and contract-related factors in operation.

Small and Medium Sized Enterprises refer to the operation of the medium-sized construction industry in China. It employs between 600 and 3000 employees, has incomes of between 30 and 300 million yuan, or assets between 40 and 400

million yuan. If it have less income or assets than those in the medium-sized construction industry classified as a small construction business. The industry is flexible in its operations. There is an acclimatization strategy in line with the general situation, and will be based on China's SMEs promotion law, which regulates the grouping guidelines for SMEs.

CHAPTER 2
LITERATURE REVIEW

The research focuses on the effect influencing of total quality management implementing toward successfully in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China. The related literature will be reviewed carefully. The rest of this chapter is organized as follows. Section 2.1 describes construction projects of small and medium-sized enterprises context. Section 2.2 explains the total quality management implementation concept. Section 2.3 describes the success concept. Section 2.4 briefly reports the TQM theory. The conclusions of this chapter are drawn in Section 2.5.

2.1 The Context of Small and Medium-Sized Enterprises

2.1.1 Background

Small and Medium-Sized Enterprises (SMEs) are a shaped of enterprise that operates in the manufacturing and distribution of things to do of small size. It is an impartial commercial enterprise privately owned, no longer underneath the have an effect on different human beings or businesses. It is low operating, and they are now few personnel. An SMEs helps in financial and social development. Small businesses are crucial because they let business owners diversify their revenue streams. To distinct organizations of people, ensuing in employment and human beings incomes income, which is an aspect that helps to guide the higher monetary and social structure.

It is also the starting point for large businesses because the growth of small businesses makes businesses stable with advanced production. These are the bases for big business. It is a source of new products as a group of people sharing creative ideas, and produce new products into the market where large businesses do not dare to investment.

The Regulations divide small and medium-sized enterprises (SMEs) into three categories: medium, small and mini. The higher restrict fashionable for medium-sized organisations are the decrease restrict well known for large-sized enterprises.

Individual companies and industries different than these certain in the Regulations are additionally classified by using reference to the Regulations (Shira, 2011).

The specific standards for different industries are as follows:

Classification Standards for SMEs in China (All revenue and asset figures are in RMB)				
Industry	Specific standard (upper limit)	Medium	Small	Mini
Agriculture, forestry, livestock farming, fishery	Operating revenue < 200 million	Operating revenue ≥ 5 million	Operating revenue ≥ 0.5 million	Operating revenue < 0.5 million
Heavy industry	Number of employees < 1,000 persons Or, Operating revenue < 400 million	Number of employees ≥ 300 persons And, Operating revenue ≥ 20 million	Number of employees ≥ 20 persons And, Operating revenue ≥ 3 million	Number of employees < 20 persons Or, Operating revenue < 3 million
Architecture	Operating revenue < 800 million Or, Total assets < 800 million	Operating revenue ≥ 60 million And, Total assets ≥ 50 million	Operating revenue ≥ 3 million And, Total assets ≥ 3 million	Operating revenue < 3 million Or, Total assets < 3 million
Wholesale trade	Number of employees < 200 persons Or, Operating revenue < 400 million	Number of employees ≥ 20 persons And, Operating revenue ≥ 50 million	Number of employees ≥ 5 persons And, Operating revenue ≥ 10 million	Number of employees < 5 persons Or, Operating revenue < 10 million
Retail industry	Number of employees < 300 persons Or, Operating revenue < 200 million	Number of employees ≥ 50 persons And, Operating revenue ≥ 5 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 1 million	Number of employees < 10 persons Or, Operating revenue < 1 million
Transportation industry	Number of employees < 1,000 persons Or, Operating revenue < 300 million	Number of employees ≥ 300 persons And, Operating revenue ≥ 30 million	Number of employees ≥ 20 persons And, Operating revenue ≥ 2 million	Number of employees < 20 persons Or, Operating revenue < 2 million
Warehousing industry	Number of employees < 200 persons Or, Operating revenue < 300 million	Number of employees ≥ 100 persons And, Operating revenue ≥ 10 million	Number of employees ≥ 20 persons And, Operating revenue ≥ 1 million	Number of employees < 20 persons Or, Operating revenue < 1 million
Postal industry	Number of employees < 1,000 persons Or, Operating revenue < 300 million	Number of employees ≥ 300 persons And, Operating revenue ≥ 20 million	Number of employees ≥ 20 persons And, Operating revenue ≥ 1 million	Number of employees < 20 persons Or, Operating revenue < 1 million
Accommodation industry	Number of employees < 300 persons Or, Operating revenue < 100 million	Number of employees ≥ 100 persons And, Operating revenue ≥ 20 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 1 million	Number of employees < 10 persons Or, Operating revenue < 1 million
Restaurant and catering industry	Number of employees < 300 persons Or, Operating revenue < 100 million	Number of employees ≥ 100 persons And, Operating revenue ≥ 20 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 1 million	Number of employees < 10 persons Or, Operating revenue < 1 million
Information transmission industry	Number of employees < 2,000 persons Or, Operating revenue < 1 billion	Number of employees ≥ 100 persons And, Operating revenue ≥ 10 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 1 million	Number of employees < 10 persons Or, Operating revenue < 1 million
Software and IT service	Number of employees < 300 persons Or, Operating revenue < 100 million	Number of employees ≥ 100 persons And, Operating revenue ≥ 10 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 0.5 million	Number of employees < 10 persons Or, Operating revenue < 0.5 million
Real estate development industry	Operating revenue < 2 billion Or, Total assets < 100 million	Operating revenue ≥ 10 million And, Total assets ≥ 50 million	Operating revenue ≥ 1 million And, Total assets ≥ 20 million	Operating revenue < 1 million Or, Total assets < 20 million
Property management industry	Number of employees < 1,000 persons Or, Operating revenue < 50 million	Number of employees ≥ 300 persons And, Operating revenue ≥ 10 million	Number of employees ≥ 100 persons And, Operating revenue ≥ 5 million	Number of employees < 100 persons Or, Operating revenue < 5 million
Tenancy and business services industry	Number of employees < 300 persons Or, Operating revenue < 1.2 billion	Number of employees ≥ 100 persons And, Operating revenue ≥ 80 million	Number of employees ≥ 10 persons And, Operating revenue ≥ 1 million	Number of employees < 10 persons Or, Operating revenue < 1 million
Other unlisted industries	Number of employees < 300 persons	Number of employees ≥ 100 persons	Number of employees ≥ 10 persons	Number of employees < 10 persons

Figure 1 China issues classification standards for SMEs.

Source: Shira (2011).

Small and medium-sized businesses in China are becoming more significant as the country's private sector grows and develops, according to Liu (2007). The ideas are used to speed up, cut expenses, and create a fresh impact on the building sector. New knowledge has been encouraged when combined with governmental policy, contribute to the development of new digital technologies and new tools or equipment to reach modernism. SMEs have evolved into the primary engines of China's economic growth, whether through taxation or financial assistance by adding additional cash to the budget.
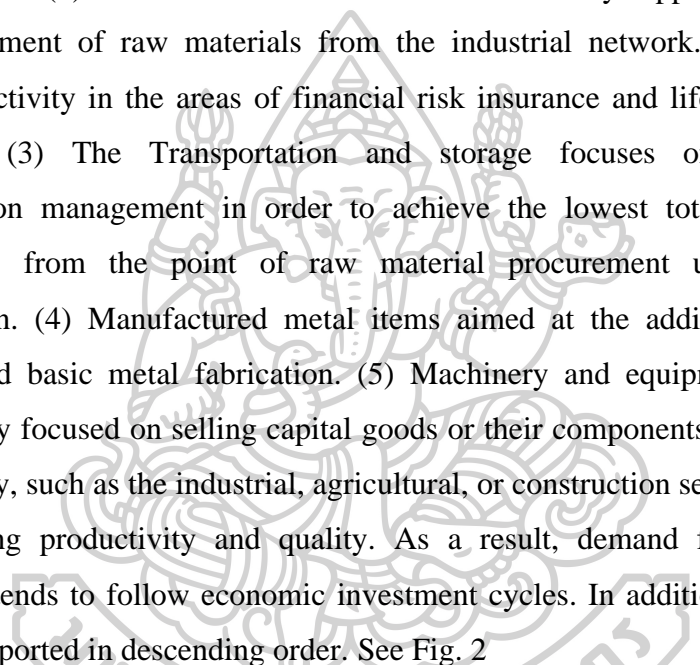
Statistics show that in 2022, there are more than 40 million small and medium enterprises, accounting for more than 99.6% of the total number of enterprises in China. According to the data from the China Department of Business Development, it can be seen that there are approximately 79,648 registered construction entrepreneurs nationwide, of which more than 99.9 percent are SMEs (China SMEs, 2022).

In terms of contribution to China's overall economic growth, small and medium-sized enterprises make a large contribution to the industry, contributing 59% of GDP and accounting for more than 65% of China's import and export turnover. Tax revenue paid by SMEs in the same year still accounted for more than 48% of total government tax revenue. Thus, it can be concluded that SMEs are intermediaries linking businesses of all sizes. Include other related manufacturing sectors, because there is investment flexibility, help create jobs in the industry, new products or new skills are produced in the market, improve the experience of entrepreneurs and team. More choices for consumers or partners. and ultimately cause domestic working capital.

As for the development state of affairs in China, in 2022, there were a gradual growth. The majority of the development things that come up, whether they be public or private construction, are ongoing projects. In addition to the growth of governing bodies and the non-profit sector. Alongside the expansion of both governmental and non-governmental organizations. The home improvement industry is yet another fascinating market. According to the Office of the Financial and Social Development Council (2022), there are about 126.9 million residences in the United States, making

this a sizable market. The customers will spend about 185 billion Yuan in the housing restoration and enhancement market every year.

The presence of conditions that allow for continued positive expansion in the domestic construction industry. This means that the direction of the construction volume is still positive. This should be good for SMEs entrepreneurs. However, the building industry's environment has altered dramatically. This will have an impact on the course of this set of entrepreneurs' businesses. because it is important in some businesses are: (1) Commercial activities will be financially supported, particularly in the procurement of raw materials from the industrial network. (2) Financial and insurance activity in the areas of financial risk insurance and life insurance will be supported. (3) The Transportation and storage focuses on assisting cargo transportation management in order to achieve the lowest total cost of product distribution, from the point of raw material procurement until the point of consumption. (4) Manufactured metal items aimed at the additive manufacturing industry and basic metal fabrication. (5) Machinery and equipment production is nearly solely focused on selling capital goods or their components to other sectors of the economy, such as the industrial, agricultural, or construction sectors, with the goal of increasing productivity and quality. As a result, demand for machinery and equipment tends to follow economic investment cycles. In addition, other industries must be supported in descending order. See Fig. 2
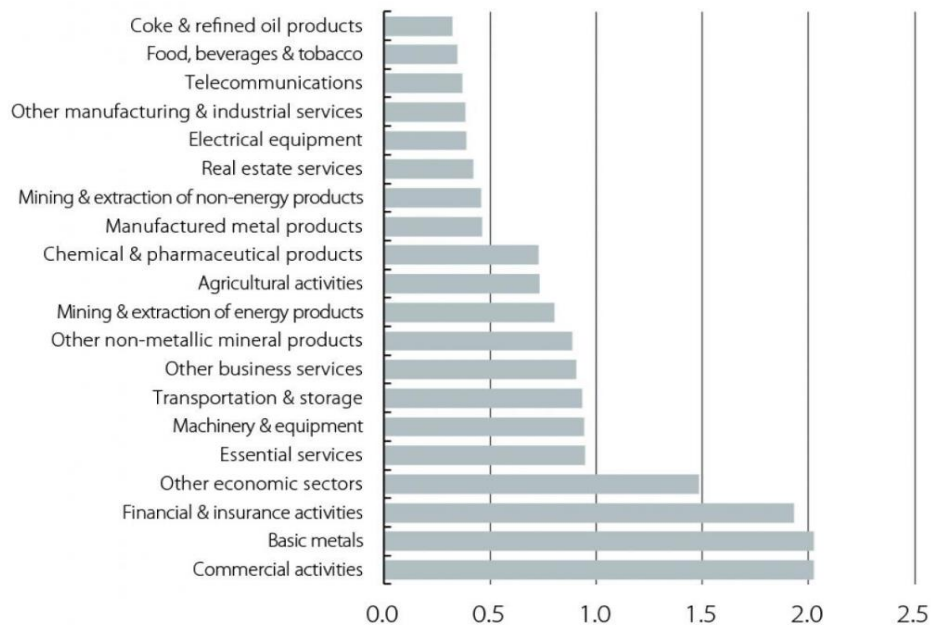
Figure 2 Economic value added by industry sectors.
Source: CaixaBank Research (2022)

From Figure 2, past activities, it is recognized that SMEs' activities can have a direct and similar impact to other major economies. According to the analysis, China's relative share of 24% is comparable to that of other emerging and developing nations. It is substantially exceed raw numbers for other sophisticated economies, little more than some of its Asian neighbors like Japan and South Korea (20% apiece). 18% of the GDP is attributed to this sector, See Fig. 3
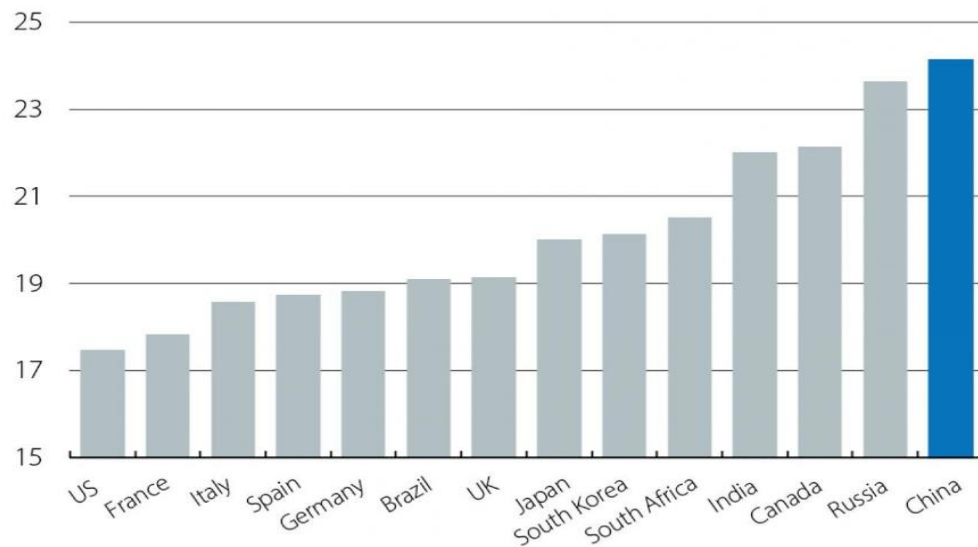
Figure 3 GDP percentage of construction sector.
Source: Caixa Bank Research (2022)

2.1.2 Problems and limitations of SMEs.

Problems and limitations of SMEs can be classified (Oxford Economics, 2023) as follows:

1) The majority of SMEs solely cater to the demands of the local market when it comes to marketing. In particular, the nation, but still lacks of knowledge and abilities in international marketplaces.

2) In terms of money, most SMEs frequently experience a lack of money. It might be challenging to get a loan from a financial institution for an investment or business expansion, because there is no systematic accounting and there is no collateral.

3) Labor turnover rate of SMEs is high. This is due to the fact that highly skilled workers prefer to work in big factories with better procedures and rewards. Additionally, the level of worker quality varies. As a result, both product quality and production effectiveness are impacted.

4) Due to minimal investment, the majority of SMEs adopt simple production methods. Additionally, business owners and staff lack the fundamental understanding needed to support contemporary methods and methods. As a result,

there hasn't been much progress made in developing product designs or high- quality standards.

5) The management of SMEs frequently lacks management expertise and structured management. However, they frequently get knowledge via personal experience and manage their families.

6) The vast majority of SMEs are founded voluntarily and receive no official government support. However, there isn't a single factory that has been registered for commercial registration. As a result, it is actively preventing itself from using government services. Due to poor tax payment procedures and a lack of knowledge about environmental protection or maintaining security as required by law.

7) In terms of private organizations that provide promotion and development services. There are a number of them, including the China Chamber of Commerce, the Industry Promotion Department, the Sales Department, the Skills Development Department, the Export Promotion Department, the Council Office of the China Industrial Investment Federation, and other business and industry associations.

It is supports the growth and promotion of SMEs, but due to the large number of SMEs and their widespread distribution throughout the nation, along with the restrictions placed on these organizations in terms of their staff, financial resources, number of branch offices, and educational institutions. They are unable to adequately and thoroughly respond to requests.

8) In terms of information perception, the majority of SMEs entrepreneurs struggle to recognize news in a variety of contexts, such as government programs and initiatives. Network data from suppliers of raw materials and marketing data, etc.

As a result of these restrictions, SMEs are unable to expand as they ought to. Personnel have potential and limited working capital, with the exception of a few SMEs that have an excellent working system. The due in to the lack of liquidity in the labor market and the unfavorable reputation of entrepreneurs in that region's society and financial institutions. In the end, growth is impeded.

The construction industry is a type of SMEs that are significant to the economy. It is connected to numerous other industries, including real estate development, the production of building materials, and the registration of businesses with the government. When a customer agrees to have a house built. There is occasionally a chance that there will be mistakes, harm, or unfavorable circumstances.

This took place in ambiguous conditions, and impacted performance with delays like late work approval. It is difficulty withdrawing materials, taking a long time to create an order, and workers being absent during harvest.

Time-related material delivery risk, the possibility of a delivery being delayed or not meeting the terms of the contract. The potential for fines. financial hazards, such as expenses spiraling out of control due to reimbursements at several sites, or the danger of being sued for damages. If the owner refuses to accept the work as scheduled. Construction of the contractor's project may be delayed or even put on hold due to insufficient.

The financial resources or the price volatility of building materials. There are also legal hazards involved, such as inadequately thorough construction contracts. Construction work is therefore a process that holds the fundamental framework together till the formation of the building's homes or utilities. The purpose of this is to make human use easier.

2.1.3 Types of construction

The construction industry is diverse and can be generally divided into 4 types namely: (1) residential or housing (2) industrial (3) commercial, and (4) civil works for public utilities (Adil et al., 2019) as the following:

1) Residential or Housing

The housing has become an important factor in people's livelihood. Technological advancement comes with new innovations. In order to apply to the development of the increasingly continuous construction work in the construction of each project, the contractor must have knowledge of many aspects and knowledge as necessary, including construction technology.

The implement related to the method and sequence of construction. These are the factors that will help govern what architects or engineers draw and build lists. Until it becomes a perfect building in the future, so it is very important for the contractor to be familiar with the technology in the different construction processes.

2) Industrial

The industrial sector plays a crucial role in economies by producing goods and services to meet various needs. Industrial activities present challenges such as environmental pollution, resource depletion, and social inequality. Therefore, it is crucial to balance industrial growth with sustainability and ethical practices, to ensure long-term benefits.

Industrial can be divided into 3 sources:

2.1) Work from the private sector for jobs in the private sector. It is divided into two sub-sections as follows:

2.1.1) Investment is linked to jobs associated with the firm. The profit and loss will be examined, when creating a factory or office building to be used as a place of business, for example, it is frequently required to have a business-related focus on the project, while some construction work related to real estate development, which is a construction for sale or to buy for services such as factories, hotels, resorts, condominiums, apartments and housing estates.

2.1.2) No related to the business, i.e. housing construction to provide convenience, comfort, and to provide people with a good quality of life.

2.2) Jobs from state enterprises for work in the state enterprise. There will be operations similar to those of private businesses. The part of the investment will come from the government as well. The remainder will come from revenue from the sale of various services. For the construction of government enterprises, it is often the construction of projects that are directly related to the work of that agency, such as the construction of expressways, such as the construction of expressways.

There will be revenue from the port government's toll collection, including the construction of the wharf. There will be income from the collection of

royalties or the collection of warehouse rent. China Electricity Generating Authority, i.e.

The construction of power plants and power distribution systems with revenue from the sale of electricity and the supply of water, including the construction of a water purification plant or the installation of pipelines distribution water. There will be revenue from the sale of tap water.

2.3) Work from the government sector for construction work in the government sector. It is usually a construction that is related to utilities, not for profit. There are examples of government agencies such as the department of Highways responsible for the construction of national highways, bridges, the Royal Irrigation Department is responsible for the construction of dams. Water canals and structures that play a role in all irrigation and the department of public works will build roads, bridges, sewerage systems in the city's urban areas, with the construction of all costs from the state budget.

3) Commercial

Commercial building is a broad category that can describe many types of commercial facilities. These include offices, retail stores, shopping malls, hotels, and other facilities built for commercial purposes. Compared to residential construction, commercial projects are exponentially more complex. Commercial developers and designers must consider a variety of needs, including functionality, safety, environment, energy efficiency and accessibility, and more.

Typically, price tags for these projects typically require contractors and subcontractors to meet more stringent prequalification standards than civil contractors, such as the ability to link to support numbers. contract money.

4) Civil Works

Civil engineering refers to large engineering projects, usually related to infrastructure and public works. These projects include transportation systems (highways, bridges and tunnels, railroads, airports, etc.), utilities (water and sewage systems, communications and distribution networks, etc.), and other large public works projects. Civil and infrastructure projects tend to be highly technical projects

with complex designs. Therefore, pre-development and pre-construction stages can be incredibly large.

In conclusion, It is not uncommon for construction projects to take years to prepare.

2.2 Total Quality Management

2.2.1 Evolution

In 1961, Feigenbaum put forward a quality system with quality as the core, orderly processing, control, and command within the organization, and a quality system for the entire process of R&D, design, production, and service. This requires enterprises to define and describe the responsibilities of all operations from quality control to management review, when implementing total quality management, so as to minimize the risk of non-compliance and maximize organizational efficiency. The quality management of construction projects is the key to implementing TQM. A crucial stage in carrying out quality management for construction units is identifying and enhancing the quality chain of projects (Yusof et al., 2000). The level of quality control concentration during project implementation is the key to determining if a project can be carried out properly.

TQM identifies and reduces or eliminates errors in manufacturing, streamlines supply chain management, improves the customer experience, and ensures that employees have the latest training process. The purpose of comprehensive quality management is to ensure that all parties involved in the production process are responsible for the overall quality of the final product or service (Barone et al., 2023).

TQM is overall quality management. It is a management approach to long-term success. By listening to customer satisfaction, continuous quality improvement, which places a focus on innovation within the business, encourages participation from every member, and produces goods and services in accordance with consumer demands. Therefore, TQM is important to the organization because (1) building customer satisfaction and loyalty: from the customer receiving the product or service. That is better than expectations. (2) cost reduction: improvement of the system for the better, help reduce wasted activities from the system. (3) create a good culture in the

organization: using TQM helps to engage and improve the quality of employees, and (4) increase revenue: revenue will increase from the number of customers more including more income from reducing expenses.

2.2.2 Importance of TQM in SMEs construction

Since TQM is an intertwined operation thinking and set of practices that address an organizational wide stimulant of quality, commencing from the top operation but with the involvement of all the situations of workers in the organization. According to Kazemi (2011) the main benefits of using TQM in construction projects can be explained as follows: production of higher quality products, increase efficiency and effectiveness through the integrated work of all employees, reduce labor hours and overall construction costs, and focus on communication systems at all levels of the organization.

Kamal and Flanagan (2014) explain that SMEs in the construction sector are mainly subcontractors for small and medium-sized projects and major construction companies. There should be a focus on coordination with stakeholders. At each stage, stakeholders must continuously learn new skills, focus on construction cost management systems, and gain practical experience in order to effectively achieve the set goals, has an effective team and network involved, and achieves a stable financial position by instilling trust in its stakeholders.

In the context of Sri Lanka's construction industry China National Construction Association identifies contractors, Which has been rated by the Construction Industry Development Agency (CIDA) from C4 to C10 as a contractor for SMEs, because it has the potential to drive the economy at the national level. Quazi and Padibjo (1998) support that there is increasing pressure on SMEs, the TQM system has led large organizations to enhance their overall quality management practices, as SMEs are the main suppliers of goods and services to large organizations. To be an organization that is a network to support work for greater potential. The author further emphasizes that the application of TQM has become one of the key survival factors and a competitive advantage for construction SMEs. However, as reviewed by Kazemi (2011), the effectiveness of applying TQM system in the construction activities of SMEs is still weak. Although the unit cost is lower.

Using time to work on a plan or using data to make decisions, but not making the most of the process.

2.2.3 TQM process

From the review of relevant literature. The researcher concluded that TQM process consists of 10 steps (Wickramarachchi et al., 2018). The entrepreneurs or managers must lead to participatory practice in order to improve efficiency and support the business to have long-term competitiveness. See Fig. 4, shown the steps of TQM practice.
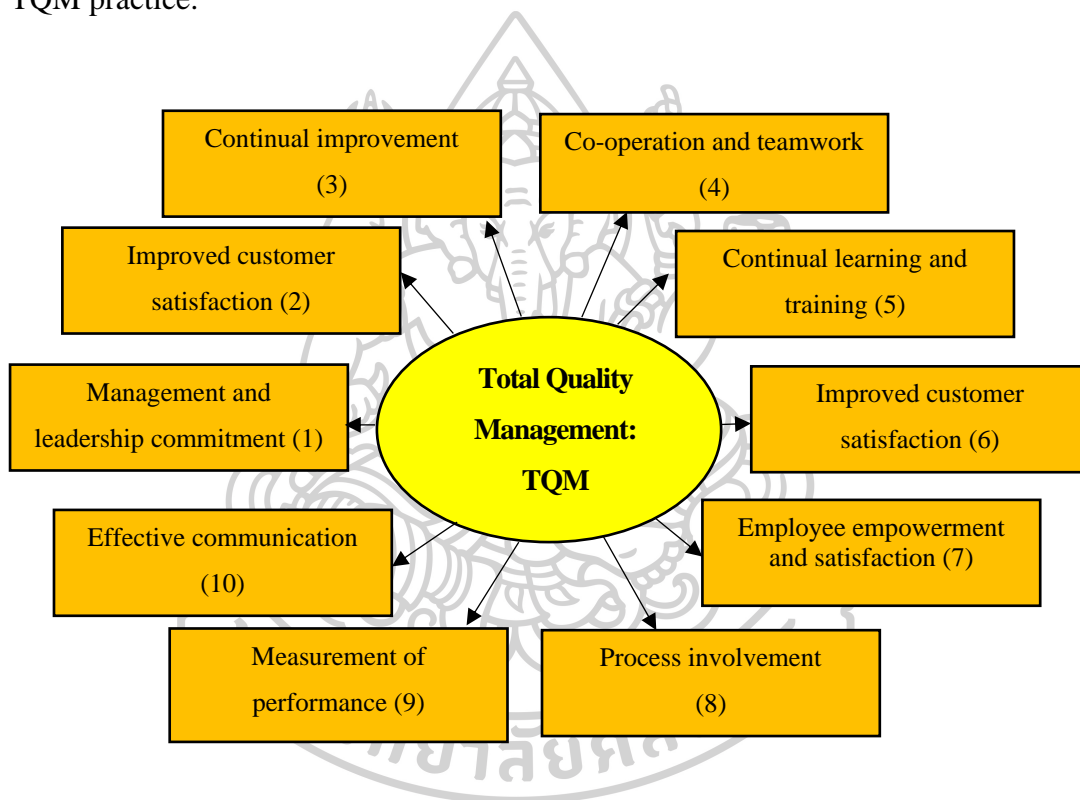
Figure 4 Total Quality Management; TQM

Source: Wickramarachchi et al. (2018).

From figure 4, Total quality management process (Wickramarachchi et al., 2018), the researcher presents the following:

1) Management and leadership commitment

Management and leadership are key components that form the backbone of any organization. They have a direct influence on the organizational culture,

performance, and long-term success. When leaders are truly committed, it creates a ripple effect throughout the entire company, fostering growth, innovation, and a positive work environment. such as:

1.1) Project execution requires trust in staff and a sense of management commitment to the project.

1.2) Continuous improvement of process quality.

2) Improved customer satisfaction

Ensuring customer satisfaction is a crucial aspect of running a successful business. The customer satisfaction are more likely to make repeat purchases and recommend your brand to others, which can significantly enhance your business's growth. Therefore, it's crucial to prioritize customer satisfaction to build a loyal customer base and increase sales. Regularly review client-related project priorities, such as:

2.1) Speed of response to customer inquiries and complaints

2.2) Provide reasonable explanations and legitimate solutions to complaints.

2.3) Establish a good attitude towards customers and technical teams.

3) Continual improvement

Continuous improvement involves enhancing product, service, and customer experience quality, fostering customer satisfaction and building solid business reputation. Ultimately, the commitment to continual improvement is not just a strategy, but a mindset that permeates the entire organization. It is about striving for excellence in project management, embracing change, and consistently raising the bar for performance and innovation, such as:

3.1) Project managers value regular discussions to improve project quality. Ongoing quality and process improvement consultations are conducted by field staff who are considered experts.

3.2) The meeting also took place in the presence of the employees of the contractor companies.

3.3) Carry out regular on-site and workplace safety checks, and have environmental protection.

3.4) Monitor the schedule and quality of the project.

Therefore, As companies learn more about their customers, processes and competition, they should evolve incrementally and strive for incremental small improvements. This concept of continuous improvement helps companies adapt to changing market expectations, allowing them to be more adaptable to different products, markets, customers and geographies. Continuous improvement also promotes and extends the competitive advantage a company has built over its affiliates.

4) Co-operation and teamwork

Co-operation and teamwork is an important aspect of life that plays a crucial role in personal, professional, and societal success. It is especially critical for organizations to thrive and remain competitive. Effective teamwork enables them to respond quickly to market demands, innovate, and deliver high-quality products or services. such as:

4.1) Organize technical workshops, and emphasize value creation with customers at the beginning of the project.

4.2) Encourage collaboration between subcontractors working in relevant locations.

5) Continual learning and training

Continuous learning helps individuals acquire new skills and knowledge, expanding their expertise and progressing in their careers. It also opens doors to new opportunities and promotions. such as:

5.1) At the beginning of the project, employees are introduced to and trained in the principles and tools of TQM.

5.2) Regular review and updating of employees' knowledge and competencies

6) Customer/supplier relationship

The relationship between customers and suppliers is integral to the success of businesses. A strong relationship between customers and suppliers is built on trust. This trust is strengthened by delivering quality products and services on time, leading to long-term partnerships. such as:

6.1) Establishment of a courteous mindset with subcontractors and exterior suppliers.

6.2) Offering or making an attempt to provide life-like options for authentic difficulties faced by subcontractors and exterior suppliers.

7) Employee empowerment and satisfaction

Empowering employees gives them more confidence and enables them to make better decisions that benefit customers. As a result, customer experiences and satisfaction improve, which ultimately has a positive impact on the company's reputation. When employees feel empowered, they have a sense of ownership and responsibility for their work. This autonomy allows them to contribute ideas, make decisions, and become more engaged and motivated, leading to increased productivity. such as:

7.1) Encourage personnel to take part in mission high-quality enchantment discussions.

7.2) Employees sense the advantages of the company' great coverage and pinnacle management dedication closer to it.

7.3) Employees are given accountability and authority to operate without monitoring and inspections.

8) Process involvement

Empowering employees can boost their confidence levels and lead to better decision-making that ultimately benefits customers. This, in turn, can improve customer experiences and satisfaction, which has a positive impact on the company's reputation. When employees feel empowered, they take ownership of their work and become more responsible (Kamal et al., 2014). This autonomy allows them to

contribute ideas, make decisions, and become more engaged and motivated, leading to increased productivity. such as:

8.1) Encourage involvement of subcontractors and exterior suppliers to participate in procedure pleasant enchantment discussions.

8.2) Ensure on the spot evaluate on procedures to account for format adjustments during construction.

9) Measurement of performance

Measuring performance is crucial to determine the effectiveness of goals and objectives. It provides a clear picture of progress, allowing for necessary adjustments to strategies or tactics to stay on track. such as:

9.1) Continual overview on frequency of going on re-work due to no longer satisfying the client's inspections.

9.2) Continual evaluate and evaluation of work growth and money float with records associated to real development.

10) Effective communication

Effective leaders are skilled in communication, able to clearly articulate visions, inspire others, and provide guidance for higher team morale and performance of construction. such as:

10.1) Ensure instant conversation of layout modifications to the venture crew and other applicable events at some point of construction.

10.2 Proper documentation manage machine which withdraws outmoded information and ensures the up to date facts have prevailed.

The data can be freely transferred between departments, but a human element is involved in coordinating processes and ensuring efficient operation of the entire production line. The effective communication to motivate employees and training participants along the process and to avoid process errors, whether it concerns normal day-to-day operations or major organizational changes plays an important role in his TQM (Kamal et al., 2014).

Therefore, the main practice guidelines of TQM are based on the research of Wickramarachchi et al.,2018), which the researcher has applied to create questions on the issue of TQM with 10 elements of the questionnaire under outstanding and accepted standards. by integrating with the construction projects of SMEs

2.2.4 Understanding total quality management (TQM)

Total quality management is a structured approach to managing an entire organization. The focus of this process is to improve the quality of the organization's deliverables, including goods and services, through continuous improvement of internal practices. The standards set as part of a TQM approach can reflect internal company priorities or currently enforced industry standards (Kamal et al., 2014). Industry standards can be defined at multiple levels and can include compliance with various laws and regulations governing the operations of a particular company. Industry standards can also include manufacturing items according to understood standards, even if the standards are not supported by official regulations (Barone et al., 2023).

2.2.5 Advantages and disadvantages of TQM.

If TQM is done right, companies will be able to produce products at lower prices. By focusing on quality and minimizing waste, companies that practice TQM deliver more consistent products and improve customer loyalty. The TQM impacts all departments of an organization, enabling companies to realize significant savings in material procurement, production, distribution, or back office functions. Companies that successfully implement TQM are typically able to react more quickly to change and proactively plan ahead to avoid obsolescence (Kamal et al., 2014).

To fully reap the benefits of TQM, a company must fully engage TQM principles. This requires substantial buy-in from every department across an organization. This level of commitment is very difficult to achieve, requires substantial financial investment, and necessitates all levels of management to engage in TQM.

The conversion to TQM may be lengthy, and workers may feel resistant to change. A company may be required to replace processes, employees, equipment, or materials in favor for an untested, partially-developed TQM plan. In addition, more

skilled workers may decide to leave the company if they feel TQM processes do not utilize their skillset appropriately.

1) Advantage of total quality management.

The advantage of Total Quality Management (TQM) is that it focuses on continuous improvement in all aspects of an organization's operations. By involving all employees in the process of identifying and eliminating inefficiencies, TQM can help to increase efficiency and productivity, reduce costs, and improve customer satisfaction. such as:

1.1) Provides customers with stronger, higher quality products.

1.2) Leads to lower costs across the company.

1.3) Minimizes waste throughout the production and sales process.

1.4) Enables companies to be more adaptable.

2) Disadvantage of total quality management.

The achievement of a complete cultural shift towards TQM takes time. It involves changing mindsets, behaviors, and processes across the organization. Initially, this may cause a slowdown in operations, which can have an impact on productivity before any improvements are observed. such as:

2.1) Transitioning to TQM practices may require significant financial investment.

2.2) Transitioning to TQM practices may require a long period of time.

2.3) May face resistance to change company-wide approval required for success.

2.3 Critical Success Factors

2.3.1 Introduction

Research on project success and critical success factors (CSF) is timely as it is one of the essential means for improvement effectiveness of project implementation (Chan et al., 2004). Despite ongoing efforts in all developed and developing countries to ensure the success of projects, most projects still face many challenges hindering

their success. Therefore, many studies seek to investigate these challenges, varies from country to country depending on economic, political and social conditions. It is very necessary identify success factors specific to the local environment to ensure that appropriate mechanisms are in place. One of the reasons for the difficulty in project management, especially in the government sector, is an inability to define CSF in project phases and failed to identify success factors in terms of performance and effectiveness measures (Takim et al., 2004).

Definitions of success factors vary because most of these studies are context-specific and their implementation and impact are often limited to the country and environment in which these studies operate has been conducted (Ogunlana, 2008). In addition, Yong and Mustafa (2017) note that the lack of effort to contextualize results in a context in which the structure, culture, and maturity of various participating organizations.

2.3.2 Project Success

The construction industry is an important and influential industry national economy of most countries. Thus, the pursuit of a successful project is the primary goal of all stakeholders involved in the project. However, unfortunately, yes are major challenges for both customers and subcontractors in modern construction projects to complete the project due to increasingly complex design and stakeholder's participate (Doloi, 2009). Failure to complete, the project affects not only the customer but also other members of the company (e.g. contractors, consultants, and owners) and the general public (Adil et al., 2019).

The success of the project is considered as satisfying a predefined project goals, which often include criteria such as time, cost, and performance (Kerzner, 2013). According to some studies, cost, scope and time are the three criteria for the success of a business construction project (binding triple). These three parts success criteria: cost, schedule and performance goals–became widely used as a benchmark for success in the decades that followed, and is often referred to as the "iron criterion". triangle" (Williams, 2016). Any omission in any of these criteria will hinder the adoption process, which means, the success or failure of the project depends on achieving the high productivity criteria.

Due to the presence of so many stakeholders in today's world Diverse project environment, success concept has undergone many modifications (Chan et al., 2002). With requirements and guidelines, the idea of project success is designed to help participants complete projects with the most favorable results (Chan and Chan, 2004). Project success is an elusive topic and is applied beyond the scope success of project management and traditional requirements, and lack of a unified concept and aggregation standards for construction project implementation a has long been a factor in the failure to measure success (Kerzner, 2013). The ultimate sets of goals or standards are often referred to as success criteria (Lim and Mohamed, 1999; Mladenović et al., 2013; Faten Albtoush et al. (2022).

2.3.3 Perspectives on Project Success

The definition of project success can vary from person to person is a related party. According to the owner, success means safe to use, for consultants, From the perspective of the consumer, it is quality, but from the perspective of the entrepreneur, it is the profit of the business. In addition, Lim and Mohamed (1999); Faten Albtoush et al. (2022) have presented that the overall project success probability can be divided into two categories, macro and micro as follow:

Macro vision of the project's success. From a macro perspective on the success of a project, the question will be answered: is the original purpose of the project fight? If so, the project will prove to be a success. Otherwise, it will be a failure for the project.

Micro perspective on project success. The microscopic view of the project's success will solve the smaller problems of project performance at the component level. It always happens applied after the construction of the project and parties involved in the construction. project, the value of bid bond, location of company, no defects in the Faten Albtoush et al.,2022) found that the most important and vital factors for the success of a construction project are: quality-related factors, cost-related factors, time-related factors, and time-related factors. contract-related and externally related factors. Results help project stakeholders improve construction project performance by identifying the factors that affect the success of the project. This allows them to take appropriate action for each worker to ensure the success of

their projects. In addition, this study contributes to the current state of knowledge by being one of the few studies analyzing project data to identify critical success factors of construction projects in developed countries

2.4.4 Conclusion

In addition to working with the customer's needs. The supply chain is also very important if the shipper cannot deliver on time or the product is not delivered according to the requirements. The product will affect the organization and can affect customers using both public and private services, so the TQM process consists of 10 elements which are (1) Commitment of leadership and management (2) Improve customer satisfaction (3) Continuous improvement (4) Collaboration and teamwork (5) Continuous learning and training (6) Customer/supplier relationship (7) Employee empowerment and satisfaction (8) Involvement in processes (9) Performance Measurement and (10) Effective Communication. It is therefore vital to the success of the entire business. The success can be measured in both Macro and Micro environments.

The Macro and Micro level gauges have been surveyed from many countries. Sri Lanka (Silva et al., 2015), Pakistan (Saqibm et al., 2008), Nigeria (Ojo and Gbadebo, 2012), Vietnam (Nguyen and Ogunlana, 2004), Ethiopia (Belay et al., 2017), Gaza strip (Enshassi et al., 2009). The research of Albtoush et al.,2022) concluded that (1) The top critical success factors for construction projects in Jordan are no disputes in the project, conformance to codes and standards; and accurate bill of quantities. (2) Three new critical success factors were identified in this study. The factors are no disputes in the project, the value of bid bond, and no defects in the project. and (3) the success factors can be classified into five underlying factors: (3.1) quality-related factors, (3.2) cost-related factors, (3.3) time-related factors, (3.4) contract-related factors, and (3.5) external-related factors. Thus, the success of the project at the macro was external-related factors, and micro was quality-related, cost-related, and contract-related factors levels because of the coverage of the variables studied in this study.

CHAPTER 3
RESEARCH METHODOLOGY

In this chapter, the research design and its methods are introduced. The research design can be developed on the basis of the research objectives.

3.1 Research Method

This research methodology is divided into 3 parts as follows:

First of all, the study is reviewing the related success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China, Total quality management implementing, TQM theory, and successful enterprise measurement. Then, the questionnaire about total quality management implementation and success in construction projects of small and medium-sized enterprises will be used as a data collection tool.

The population in this study were owners. The survey focuses only on business owners registered with the Kunming City Commercial Office, China in 2022 and does not cover sole proprietorships. Because the number of employees is relatively small, organizational management is not possible, so it is described as 46,147 companies (Data from Dun and Bradstreet gathers Construction business information, 2023).

The unit of analysis is a business owner or manager representing a construction company registered with the Kunming City Commercial Office (2023). The participants provided information by answering a questionnaire, and there were 400 volunteers. The researcher used Taro Yamane (1970) criteria. The confidence level is set at 95 percent, accepting an error of 5 percent, as follows:

Formula $$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{46,147}{1+46,147(0.05)^2}$$

$$= 399.99$$

In order to gather information, the researcher used a purposive sampling questionnaire that was sent through an online system. The questionnaire was distributed by sharing an online link to the Kunming Construction Contractors Association platform and sending a link into WeChat and QR Code. A total of 400 units were sampled during the month of September 2023 and responses were collected through the questionnaire. The completed questionnaires were returned through online social networking channels, with a total of 384 cases representing 96.00 percent of the sample size.

Then, existing questionnaire online delivery modes in perspectives of all owners of construction projects of small and medium-sized enterprises by asking for opinions or priorities that have been taken in the company to an ideal solution of TQM and successfully of construction projects in Kunming.

Secondly, research tools, the questionnaires is developed from TQM measures and measures of success in construction projects. The researcher developed a questionnaire using literature and research to gather data for studies.

This questionnaire is divided into three parts, which are as follows:

Part 1. Demography

Part 2. To study the importance level of total quality management implementation, as follows: (1) Commitment of leadership and management (2) Improve customer satisfaction (3) Continuous improvement (4) Collaboration and teamwork (5) Continuous learning and training (6) Customer/supplier relationship (7) Employee empowerment and satisfaction (8) Involvement in processes (9) Performance Measurement and (10) Effective Communication, and success in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

Part 3. Suggestion about total quality management implementation and success in the construction projects of small and medium-sized enterprises in Kunming.

The questions is a 5-level rating scale (Rating Scale) applied according to the Likert method (Likert, 1970), which determines 5 levels of importance as follows:

Very high important level   Score 5

High important level   Score 4

Moderate important level   Score 3

Low important level   Score 2

Very low important level   Score 1

Then the scores received were analyzed. To find the average and interpret the average according to the level of importance, which has score values as follows:

Mean 4.51 – 5.00 Criteria very high

Mean 3.51 – 4.50 Criteria high

Mean 2.01 – 3.50 Criteria moderate

Mean 1.51 – 2.00 Criteria low

Mean 1.00 – 1.50 Criteria very low

Finally, Data analysis for statistics

In this study, the researcher used descriptive statistics and inferential statistics to analyze the data with the following:

1) Descriptive statistics in the analysis of percentage, mean, and standard deviation.

2) Inferential statistics with Multiple Regression Analysis (MRA.) by Enter Selection technique.

The dependent variable is the successfully in construction projects of small and medium-sized enterprises in Kunming.

Finally, the summary of quantitative research results.

3.2 Research Tools

The research tool is an online questionnaire developed from the literature review to check the validity of the contents of the questionnaire. Checking the quality of tools used in research for this study evaluated the instruments in two stages. First, it assessed the instruments for validity, reliability, and language smoothness prior to the

survey. Then, it evaluated the overall confidence of the questionnaire after conducting the survey.

1) Checking the quality of the tools before the actual survey

The instrument used was a questionnaire which was tested for validity and reliability as follows:

1.1) To ensure content validity, the researcher presented the questionnaire to three academic experts for examination. They assessed the language used in the research and checked for consistency, including item-objective congruency (IOC). The content of the business management questionnaire was evaluated by experts who hold academic positions such as Assistant Professors. Service businesses rely heavily on management science to be applied in business management, hence the involvement of logistics management experts and consultants for transport business operators. The experts are also researchers in logistics management and have received research funding from the National Research Council of Thailand. They make use of suggestions to improve the accuracy and comprehensiveness of the questions, based on the main question elements specified.

The literature reviewed above supports these findings. The research funding received from the National Research Council of Thailand has contributed to academic success. It is important to consider any suggestions and use them to improve the accuracy and comprehensiveness of the questions, based on the specified main question elements and the literature reviewed above. Internal consistency's measurement accuracy was evaluated by assessing its reliability and determining confidence levels, following the model outlined below:

Experts determine the scores using the following process.

+1 mean the questions are related to the variables' stories.

-1 mean the questions are not related to the variables' stories.

 0 mean I'm not sure if the question aligns with the storyline of the variation.

The criteria for interpretation are listed below:

IOC $\geq$ .50 mean the questions are consistent with the research objectives.

IOC < .50 mean the questions are not consistent with the research objectives.

The researcher received assistance from three experts in evaluating the consistency between the questions and the intended research objectives.

The validity of the content is consistent between the question and the objective. (Index of Item-Objective Congruence; IOC) for three-point was (1) Total Quality Management Implementing, ten elements (2) Successfully in construction projects. Let's measure the validity of the content by analyzing the consistency between the question items and the objectives (IOC) and the consistency between the questions (Rovinelli and Hambleton, 1997). Expert opinions are taken into consideration when determining the Intra-Observer Correlation (IOC) for each question. Only questions with an IOC value ranging from 0.50 to 1.00 are selected. The questions with an IOC value below 0.50 are improved based on suggestions and then further reviewed by an advisor for additional guidance. The results of the analysis to determine the reliability of the questionnaire. The average index of compliance IOC between 0.77-1.00

Table 1 Content validity of the scale

Scale	Content validity
1. Management and leadership commitment	0.96
2. Improved customer satisfaction	0.96
3. Continual improvement	1.00
4. Co-operation and teamwork	1.00
5. Continual learning and training	1.00
6. Customer/supplier relationship	0.77
7. Employee empowerment and satisfaction	1.00
8. Process Involvement	1.00
9. Measurement of performance	0.77
10. Effective communication	1.00
11. Success in construction projects	1.00

From Table 1, it is found that the questionnaire has a reliability value higher than 0.50 in all aspects, indicating that the questionnaire has high reliability.

First, complete the revised questionnaire that has been reviewed by three experts. Then, administer the questionnaire to 30 individuals who have the same qualifications as the owner of a construction project at Guangxi Province, but who are not a part of the research sample. Use the resulting data to calculate the reliability value, or alpha coefficient (α-coefficient), using Cronbach's method. The overall confidence value should be 0.7 or higher, as recommended by Nunnally (1978), which indicates a reliable measure of 0.70 or greater. The Cronbach's alpha coefficient of the between score = 0.798 to 0.814, The questionnaire has a total value of 0.876, exceeding the acceptable threshold of 0.70 based on Nunnally & Bernstein's criteria (1994). The details are presented as shown in Table 2 as follows:

Table 2 Cronbach's alpha coefficient of scale

Scale	Cronbach's alpha
1. Management and leadership commitment	0.809
2. Improved customer satisfaction	0.804
3. Continual improvement	0.812
4. Co-operation and teamwork	0.801
5. Continual learning and training	0.798
6. Customer/supplier relationship	0.800
7. Employee empowerment and satisfaction	0.802
8. Process Involvement	0.807
9. Measurement of performance	0.811
10. Effective communication	0.813
11. Success in construction projects	0.814
Total average scale	**0.876**

3.3 Collection of Information

This study was a questionnaire survey. A questionnaire is a tool for collecting information as follows:

3.3.1 Data collected from the population entrepreneurs or managers, or committees of construction projects of small and medium-sized enterprises in Kunming, including branch managers of small and medium-sized enterprises in Kunming, the People's Republic of China.

3.3.2. The period of data collection for this study. Data collection from June 2023 to December 2023, totaling 7 months.

3.4 Conceptual Framework

The result of the concept review, theory, and related research. The authors concluded that total quality management implementation has 10 components, developed from the scales of Lim and Mohamed (1999); Faten Albtoush et al.,2022). the project's prospects for success can be divided into two types, macro; external-related factors, and micro; quality-related, cost-related, and contract-related factors. See Fig. 5 Conceptual Framework.

Total Quality Management: TQM

1. Management and leadership commitment

2. Improved customer satisfaction

3. Continual improvement

4. Co-operation and teamwork

5. Continual learning and training

6. Customer/supplier relationship

7. Employee empowerment and satisfaction

8. Process Involvement

9. Measurement of performance

H:1a-k →

Success in construction projects

- Macro; external-related factors

- Micro: quality-related, cost-related and contract-related factors

Figure 5 Conceptual Framework

3.5 Research Hypothesis

H:1a Management and leadership commitment had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1b Improved customer satisfaction had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1c Continual improvement had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1d Co-operation and teamwork had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1e Continual learning and training had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1f Customer/supplier relationship had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1g Customer/supplier relationship had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1h Employee empowerment and satisfaction had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1i Process Involvement had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1j Effective communication had a direct effect on successful construction projects of small and medium-sized enterprises.

H:1k The total quality management implementation had a direct effect on successful construction projects of small and medium-sized enterprises.

3.6 Research Procedure

Before presenting the successfully model of construction projects of small and medium-sized enterprises in China. The researcher assessed the state of construction projects in Kunming and identified research questions by reviewing concepts, theories, and relevant literature. Various variables that impact the success of construction projects were extracted as well. Next, the research was designed and a quantitative questionnaire was created as a research tool. The questionnaire was reviewed by three experts to ensure its effectiveness. The questionnaire content was reviewed by experts and adjusted accordingly. It was then tested on a sample group of construction project owners and managers in Guangxi, which included 30 people with similar characteristics to the research sample. Following that, the process of collecting data commenced. By using the online questionnaire via OR Code with the construction contractors association in Kunming, by coordinating with the association president in advance to request assistance in collecting data, see Figure 3.2. Through an online questionnaire, it took 2 weeks, after which data was collected to cover a sample unit of 400 people according to the number specified. and analyzed using descriptive statistics and inferential statistics. This is followed by a summary of the research findings and a report of the research results, as shown in Fig. 6, therefore, the possible scenarios are divided into the following:

Figure 6 QR Code
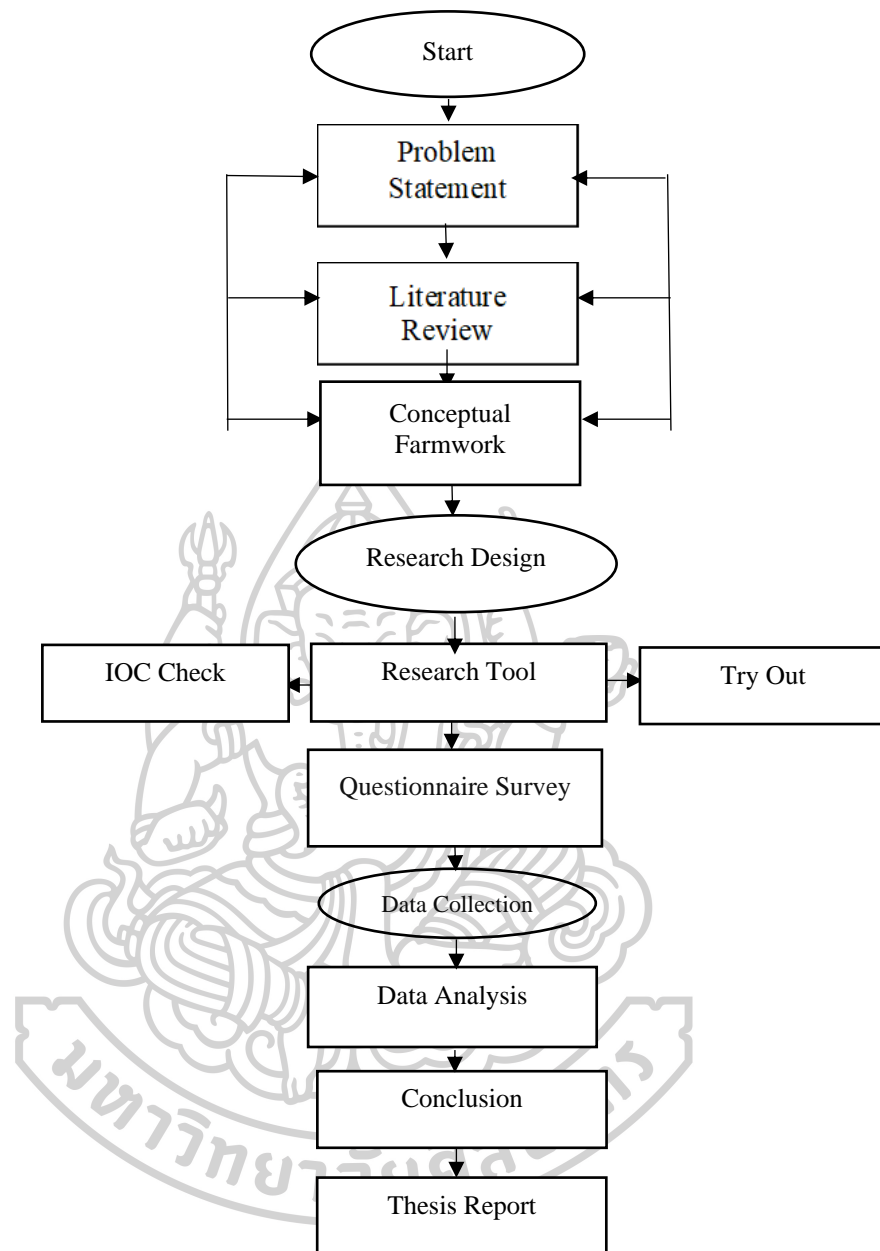
Figure 7 Research Process Flow Chart

3.7 Research Outline

      The researcher has outlined 9 steps that should be followed when conducting research as follows:

      Step 1. In a one-month period, the problem statement and literature reviews related to TQM and construction project success in SMEs are studied.

      Step 2. It will take an additional month to review related variables, including the independent variable of TQM implementation, consisting of 10 elements, and the dependent variable of successful construction projects in SMEs.

      Step 3. As part of the study, we will be analyzing ongoing construction projects in small and medium-sized enterprises over a period of two months.

      Step 4. The researcher conducted a literature review to identify relevant variables and establish the conceptual framework.

      Step 5. In order to obtain the correct answer to a research problem, it is important to conduct a well-designed research. This involves creating a research framework that specifies the relationship between the variables under study. The framework serves as a guideline for data collection and analysis, ensuring that the data collected is clear, accurate and reliable.

      Step 6 The process involves developing and testing the research tool for IOC values and reliability before conducting the survey.

      Step 7 Performing data analysis using software programs.

      Step 8 Data analysis involves the use of descriptive and influential statistics to draw conclusions.

      Step 9. Presenting new knowledge research findings through a summary and discussion of results, followed by reporting the findings.

CHAPTER 4
RESULTS AND ANALYSIS

The key points to study the importance level of implementing total quality management and success in construction projects of small and medium-sized enterprises, to study the effect influencing total quality management implementation successfully in the construction projects of small and medium-sized enterprises, and to study a model of the success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China. This paper uses a questionnaire as a main tool in order to collect the data.

4.1 Demography of owner's construct projects of SMEs

The respondent profile is shown in Table 3, The table showed the information about the number of demography of owner's construct projects of small and medium-sized enterprise by providing the frequency and percentage of each. The research results are summarized, as follows:
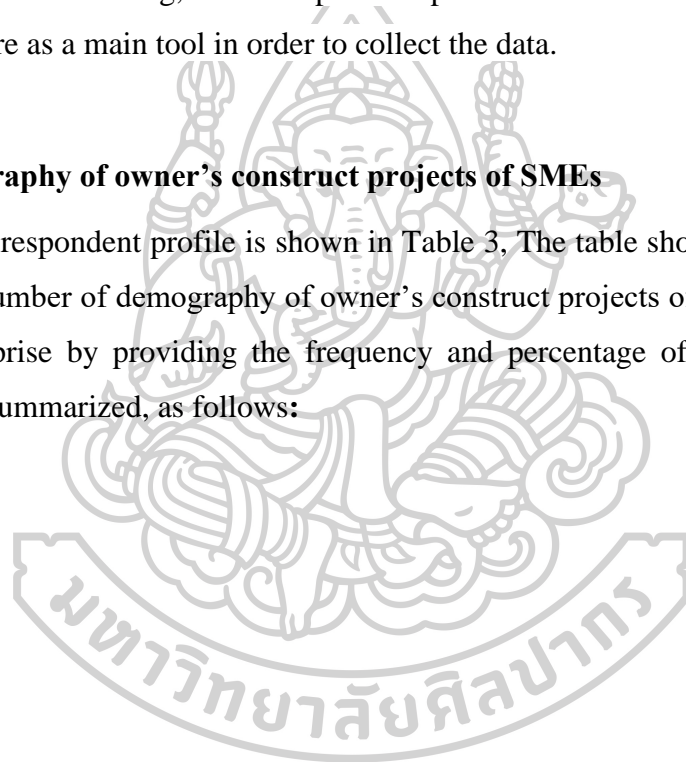
Table 3 Demography of owner's construct projects of SMEs.

(n=384)

General	Demography	Number	Percentage
Gender	Males	289	75.26
	Females	95	24.74
Age	31 – 40 Years	81	21.09
	41 – 50 Years	195	50.78
	51 – 60 Years	76	19.79
	60 Years or older	32	8.34
Status	Single	67	17.45
	Merrit	286	74.48
	Separated	16	4.17
	Divorce	15	3.91
Education	Below Bachelor Degree	29	7.55
	Bachelor's Degree	195	50.78
	Master's Degree	143	37.24
	Doctoral Degree	17	4.43
Position	Owner	267	69.53
	Manager	117	30.47

Table 3 Demography of owner's construct projects of SMEs. (Cont.)

General	Demography	Number	Percentage
Investment in a business	Individual investors	32	8.33
	Individual investors and family offices	68	17.71
	Individual investors and corporate investors	36	9.37
	Individual investors, corporate Investors, and financial institution	117	30.47
	Individual investors and financial institution	131	33.85
Number of employees	Fewer than 1,000 peoples	306	79.69
	1,001-2,000 peoples	78	20.31
Age of the company	Less than 5 years	77	20.05
	5-10 Years	196	51.04
	11-15 Years	93	24.22
	16-20 Years	16	4.17
	21 Years or More	2	0.52
Types of construction projects	Residential or housing	93	24.22
	Industrial	12	3.125
	Commercial	152	39.58
	Civil works for public utilities	107	27.86
Size of construction projects	Large-sized	163	42.45
	Small-sized	139	36.19
	Mini-sized	82	21.36

Table 3 Demography of owner's construct projects of SMEs. (Cont.)

General	Demography	Number	Percentage
Construction project income (Including work of all systems)	Fewer than 30 million yuan	302	78.64
	30-70 million yuan	70	18.23
	71-110 million yuan	12	3.13

Table 3 Demography of owner's construct projects of small and medium-sized enterprise According to the research, the majority of individuals who undertake construction projects are male, accounting for 75.26% of the respondents. The age group with the highest representation is between 41 and 50 years old, accounting for 50.78%, followed by the 31-40 age group with 21.09%, and the 51-60 age group with 19.79%. The majority of respondents are married, accounting for 74.48%, followed by single individuals with 17.45%. Most of the respondents have a bachelor's degree (50.78%), followed by those with a master's degree (37.24%). The majority of respondents are individuals who own construction projects (69.53%), followed by managers (30.47%).

The investment in the business is mostly from individual investors and financial institutions (33.85%), followed by individual investors, corporate investors, and financial institutions (30.47%), and individual investors and family offices (17.71%).

The majority of companies in this industry have fewer than 1,000 employees, accounting for 79.69% of the sector. The next most common employee count is between 1,001 and 2,000, making up 20.31%. In terms of company age, 51.04% have been operating for 5-10 years, with 24.22% in the 11-15 year range and 20.05% less than 5 years old. Commercial operations make up the largest percentage of construction projects at 39.58%, followed by civil works for public utilities at 27.86% and residential or housing at 24.22%. Large-sized projects are the most common, making up 42.45%, followed by small-sized at 36.19% and mini-sized at 21.36%. When it comes to construction project income, the majority involve investments of

less than 30 million yuan, accounting for 78.64%. The next most common income bracket is 30-70 million yuan at 18.23%, followed by 71-110 million yuan at 3.13%.

4.2 Research Objective

4.2.1 To study the importance level of implementing total quality management and success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

Table 4 Descriptive statistic analysis of management and leadership commitment importance

1. Management and leadership commitment	S.D.	Mean	Level of importance
1.1 Project execution requires trust in the staff and a sense of management commitment to the project.	0.725	4.19	High
1.2 Executives evaluate employees' performance fairly.	0.752	4.11	High
1.3 Focus on the importance of prioritizing a dedication to management and leadership in order to bring about change throughout all levels of the organization.	0.715	4.08	High
Total average	**0.730**	**4.13**	**High**

According to Table 4, management and leadership commitment is high important. The total average score was 4.13 with a standard deviation of 0.730. which indicates a high level of importance. When analyzing the factors, it was found that trust in staff and management commitment to the project were the most important factors, with a mean score of 4.19 and a standard deviation of 0.725. Following this,

executives evaluating employees' performance fairly was also a significant factor, with a mean score of 4.11 and a standard deviation of 0.752. Lastly, it is important to prioritize dedication to management and leadership in order to bring about change at all levels of the organization, with a mean score of 4.08 and a standard deviation of 0.715.

Table 5 Descriptive statistic analysis of customer satisfaction improvement importance

2. Customer satisfaction improvement	S.D.	Mean	Level of importance
2.1 Our project strives for continual improvement in work quality to ensure complete customer satisfaction.	0.610	4.19	High
2.2 The company has a system to measure and track service quality to ensure customer satisfaction.	0.652	4.09	High
2.3 Every employee in the organization is responsible for maintaining quality to ensure customer satisfaction.	0.720	4.15	High
Total average	**0.661**	**4.14**	**High**

According to Table 5, customer satisfaction improvement is high important. The research results show that the total average is 4.14, with a standard deviation of 0.661, indicating a high level of importance. Upon analyzing the importance level, it was found that the first important factor for our project is striving for continual improvement in work quality to ensure complete customer satisfaction, with a mean of 4.19 and a standard deviation of 0.610. The second factor is every employee in the organization is responsible for maintaining quality to ensure customer satisfaction, with a mean of 4.15 and a standard deviation of 0.720. Lastly, the company has a system to measure and track service quality to ensure customer satisfaction, with a mean of 4.09 and a standard deviation of 0.652.

Table 6 Descriptive statistic analysis of continual improvement importance

3. Continual improvement	S. D.	Mean	Level of importance
3.1 Emphasize the importance of the work process from the beginning to the end of the process.	0.511	4.49	High
3.2 When making decisions during continuous operations, it's important to consider and use numerical data and information.	0.495	4.57	Very high
3.3 Focus on continuously working on making corrections, improvements, and enhancing our performance.	0.519	4.55	Very high
Total average	**0.508**	**4.54**	**Very high**

According to Table 6, continual improvement is very high importance. The research found that the total average was 4.54, with a standard deviation of 0.508, which indicates a very high level of importance. Upon analyzing the data, it was concluded that when making decisions during continuous operations, it is crucial to consider and utilize numerical data and information as the primary factor, with a mean of 4.57 and a standard deviation of 0.495. The second most important factor is to focus on making corrections, improvements, and enhancing performance continuously, with a mean of 4.55 and a standard deviation of 0.519. Lastly, it is essential to emphasize the importance of the work process from the beginning to the end, with a mean of 4.49 and a standard deviation of 0.511.

Table 7 Descriptive statistic analysis of co-operation and teamwork importance

4. Co-operation and teamwork	S.D.	Mean	Level of importance
4.1 The company boasts of having skilled employees and a pool of promising project contractors.	0.686	4.19	High
4.2 It is important to prioritize collaboration with networks, both internal and external to the project.	0.614	4.19	High
4.3 Provide personnel with the opportunity to contribute suggestions and opinions for the betterment and growth of the organization.	0.701	4.18	High
Total average	**0.667**	**4.18**	**High**

According to Table 7, co-operation and teamwork is high level is high important. The research shows that the total average is 4.18 with a standard deviation of 0.667, which indicates a high level of importance. Upon analyzing the importance level, it was concluded that two factors had the same average value. Firstly, having skilled employees and promising project contractors is crucial, and collaboration with both internal and external networks should be prioritized. The mean for this factor is 4.19 with a standard deviation of 0.686 and a value of 0.614. Secondly, providing personnel with the opportunity to contribute suggestions and opinions for the betterment and growth of the organization is essential. The mean for this factor is 4.18 with a standard deviation of 0.701.

Table 8 Descriptive statistic analysis of continual learning and training importance

5. Continual learning and training	S. D.	Mean	Level of importance
5.1 Focus on the importance of consistently offering opportunities for learning and offering high-quality training sessions for employees.	0.725	4.05	High
5.2 The work process focuses on continuous learning in the field and across the organization.	0.708	4.10	High
5.3 When a company implements new technology into their work, employee training is provided.	0.660	4.32	High
Total average	**0.698**	**4.16**	**High**

According to the data presented in Table 8, continual learning and training are high important. The total average score is 4.16, with a standard deviation of 0.698, indicating a high level of importance. Upon analyzing the importance levels, it can be concluded that the most crucial factor is providing employee training when a company adopts new technology, with a mean score of 4.32 and a standard deviation of 0.660. The second most important factor is the work process focusing on continuous learning within the organization and the field, with a mean score of 4.10 and a standard deviation of 0.708. Lastly, consistently offering opportunities for learning and providing high-quality training sessions for employees is also essential, with a mean score of 4.05 and a standard deviation of 0.725.

Table 9 Descriptive statistic analysis of customer/supplier relationship importance

6. Customer/supplier relationship	S. D.	Mean	Level of importance
6.1 The company analyzes customer and supplier needs before planning project implementation.	0.682	4.30	High
6.2 Focus on the importance of continuously managing relationships with customers and other relevant parties.	0.743	4.25	High
6.3 Emphasis importance on managing relationships with suppliers, particularly regarding their products or services.	0.699	4.35	High
Total average	**0.708**	**4.30**	**High**

According to Table 9, The customer/supplier relationship are high important, the research found that the total average was 4.30 with a standard deviation of 0.708, indicating a high level of importance. Upon further analysis, it was concluded that the most important factor was placing emphasis on managing relationships with suppliers, particularly regarding their products or services, with a mean of 4.35 and a standard deviation of 0.699. Following this was the company analyzing customer and supplier needs before planning project implementation, with a mean of 4.30 and a standard deviation of 0.632. Lastly, the focus on continuously managing relationships with customers and other relevant parties was found to have a mean of 4.25 and a standard deviation of 0.743.

Table 10 Descriptive statistic analysis of employee empowerment and satisfaction
importance

7. Employee empowerment and satisfaction	S. D.	Mean	Level of importance
7.1 Offer employees the opportunity to utilize their expertise and skills to meet service user needs effectively.	0.702	4.31	High
7.2 All departments promote employee engagement by encouraging them to contribute to their work with a focus on quality and overall satisfaction.	0.688	4.28	High
7.3 All personnel who are fully committed and enthusiastic in their work.	0.634	4.36	High
Total average	**0.675**	**4.32**	**High**

According to Table 10, The employee empowerment and satisfaction are high important level. The results indicate a total average of 4.32 with a standard deviation of 0.675, which is considered high. Upon analyzing the importance level, it can be concluded that the most important factor is having personnel who are fully committed and enthusiastic in their work, with a mean of 4.36 and a standard deviation of 0.634. Following this, offering employees the opportunity to utilize their expertise and skills effectively to meet service user needs is also crucial, with a mean of 4.31 and a standard deviation of 0.702. Finally, all departments should promote employee engagement by encouraging them to contribute to their work with a focus on quality and overall satisfaction, with a mean of 4.28 and a standard deviation of 0.688.

Table 11 Descriptive statistic analysis of process involvement importance

Process Involvement	S. D.	Mean	Level of importance
8.1 The company prioritizes continuous improvement of work processes to align with evolving customer behaviors and needs.	0.684	4.35	High
8.2 Many people constantly seek new ways to improve and develop their processes.	0.725	4.21	High
8.3 Activities are coordinated throughout the entire work process.	0.670	4.28	High
Total average	**0.693**	**4.28**	**High**

According to Table 11, The process involvement are high important, The research found that the total average was 4.28 with a standard deviation of 0.693, indicating a high level of importance. Upon analyzing the importance level, it was concluded that the company's focus on continuously improving work processes to align with evolving customer behaviors and needs was the most important factor, with a mean of 4.35 and a standard deviation of 0.684. The second most important factor was the coordination of activities throughout the entire work process, with a mean of 4.28 and a standard deviation of 0.670. The least important factor was the constant search for new ways to improve and develop processes, with a mean of 4.21 and a standard deviation of 0.725.

Table 12 Descriptive statistic analysis of measurement of performance importance

9. Measurement of performance	S.D.	Mean	Level of importance
9.1 Our operating processes are designed to efficiently meet the needs of our customers.	0.554	4.53	Very high
9.2 The performance of the construction project growth rate with the target.	0.515	4.47	High
9.3 The company has a responsibility to both the organization and society at large.	0.545	4.52	Very High
Total average	**0.538**	**4.51**	**Very High**

According to Table 12, The level of importance for measuring of performance is very high, with a total average of 4.51 and a standard deviation of 0.538. indicating a high level of importance. Upon analyzing the importance level, it was concluded that the factor found that our operating processes are designed to efficiently meet the needs of our customers is the most important, with a mean of 4.53 and a standard deviation of 0.554. Following this, the company has a responsibility to both the organization and society at large was found to be the second most important factor, with a mean of 4.52 and a standard deviation of 0.545. Lastly, the performance of the construction project growth rate with the target was found to have a mean of 4.47 and a standard deviation of 0.515.

Table 13 Descriptive statistic analysis of effective communication importance

10. Effective communication	S.D.	Mean	Level of importance
10.1 To achieve job goals, it's important to prioritize both formal and informal communication.	0.692	4.27	High
10.2 Hold a meeting to allow employees to share ideas, discuss work-related topics, and exchange information.	0.675	4.16	High
10.3 The use of technology and applications is useful in facilitating communication between teams for convenience and speed.	0.686	4.14	High
Total average	**0.685**	**4.19**	**High**

According to Table 13, the research results indicate that the high level of importance for effective communication, as indicated by an total average score of 4.19 and a standard deviation of 0.685, indicating a high level of importance. Upon analyzing the importance level, it was concluded that the factor found to achieve job goals, it's important to prioritize both formal and informal communication, is the most important, with a mean of 4.27 and a standard deviation of 0.692. Following this, Holding a meeting to allow employees to share ideas, discuss work-related topics, and exchange information was found to be the second most important factor, with a mean of 4.16 and a standard deviation of 0.675. Lastly, the use of technology and applications is useful in facilitating communication between teams for convenience and speed was found to have a mean of 4.14, and a standard deviation of 0.686.

Table 14 Descriptive statistic analysis of success in construction projects
      implementation

11. Success in construction projects	S. D.	Mean	Level of Implementation
11.1 Reasonable share of cost saving and risk	0.621	4.18	High
11.2 Operating productivity	0.651	4.20	High
11.3 The value of the company's investments and the number of customers has both increased.	0.644	4.21	High
11.4 The warehouse size has been expanded.	0.645	4.20	High
11.5 Construction projects are expanding.	0.618	4.22	High
Total average	**0.636**	**4.20**	**High**

According to Table 14, the importance level of success in construction projects was assessed. The research results indicate that the total average was 4.20 with a high level standard deviation of 0.636. Upon analyzing the data, it can be concluded that the most important factor for construction projects is expansion, with a mean of 4.22 and a standard deviation of 0.618. Following this, the value of the company's investments and the number of customers both showed an increase in importance, with a mean of 4.21 and a standard deviation of 0.644. The factor of operating productivity and warehouse size expansion had the same level of importance, with a mean of 4.20 and a standard deviation of 0.651 and 0.645, respectively. Lastly, a reasonable share of cost saving and risk had a mean of 4.18 and a standard deviation of 0.621, respectively.

Research Objective 2. To study the effect influencing total quality management implementation on successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

Table 15 the result of multiple regressions analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.351	.153	-	2.291	.023	-	-
Management and leadership commitment	.065	.034	.061	1.926	.055	.607	1.649
Improved customer satisfaction	.033	.039	.035	.853	.394	.367	2.721
Continual improvement	-.116	.045	-.107	-2.574	.010	.354	2.824
Co-operation and teamwork	.213	.055	.201	3.853	.000	.224	4.472

Table 15 the result of multiple regressions analysis (Cont.)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Continual learning and training	-.057	.052	-.058	-1.084	.279	.216	4.622
Customer/supplier relationship	.163	.057	.178	2.875	.004	.160	6.267
Employee empowerment and satisfaction	.220	.062	.229	3.543	.000	.145	6.878
Process Involvement	.111	.062	.108	1.799	.073	.168	5.936
Measurement of performance	.098	.059	.097	1.654	.099	.177	5.650
Effective communication	.170	.057	.169	2.980	.003	.186	5.370

Remark: a. Dependent Variable: successfully in the construction projects R = 0.879; R Square = 0.767, F = 126.753, Sig = 0.000

Table 15, Furthermore, the presence of the significant effect of the 10 predicting variables on the success of construction projects of SMEs was identified based on their sig. The effect of a predicting variable is significant if its sig. Value is less than 0.10. These findings suggest that employee empowerment and satisfaction had to regression coefficient for raw scores ($\beta = 0.220$) and for standard scores (Beta) equal to .229, which have the highest impact on success in construction projects. It was found that the variable cooperation and teamwork had to regression coefficient for raw scores ($\beta = 0.213$) and for standard scores (Beta) equal to .201. The variable customer/supplier relationship had to regression coefficient for raw scores ($\beta = 0.163$)

and for standard scores (Beta) equal to .178. The variable effective communication had to regression coefficient for raw scores ($\beta = 0.170$) and for standard scores (Beta) equal to .169. The variable process involvement had to regression coefficient for raw scores ($\beta = 0.111$) and for standard scores (Beta) equal to .108. The variable measurement of performance had to regression coefficient for raw scores ($\beta = 0.098$) and for standard scores (Beta) equal to .097. The variable management and leadership commitment had to regression coefficient for raw scores ($\beta = 0.065$) and for standard scores (Beta) equal to .061. and the variable continual improvement had to regression coefficient for raw scores ($\beta = -0.116$) and for standard scores (Beta) equal to -.107.

Table 15, on the data. Moreover, the adjusted R-Square value was (0.897), which indicated that the model's predictors explained 76.7% variation in the successful construction projects of small and medium-sized enterprises in Kunming. Total quality management implementation has ten elements explained factors as predictors of success in construction projects ($R^2 = .767$). In other words, the remaining 15.3% of successful construction projects were influenced by unexplained factors. This model is highly significant, as indicated by the F-value of F = 126.753 (p = 0.000 < 0.05). See Fig. 1 Model of Multiple Regression Analysis.
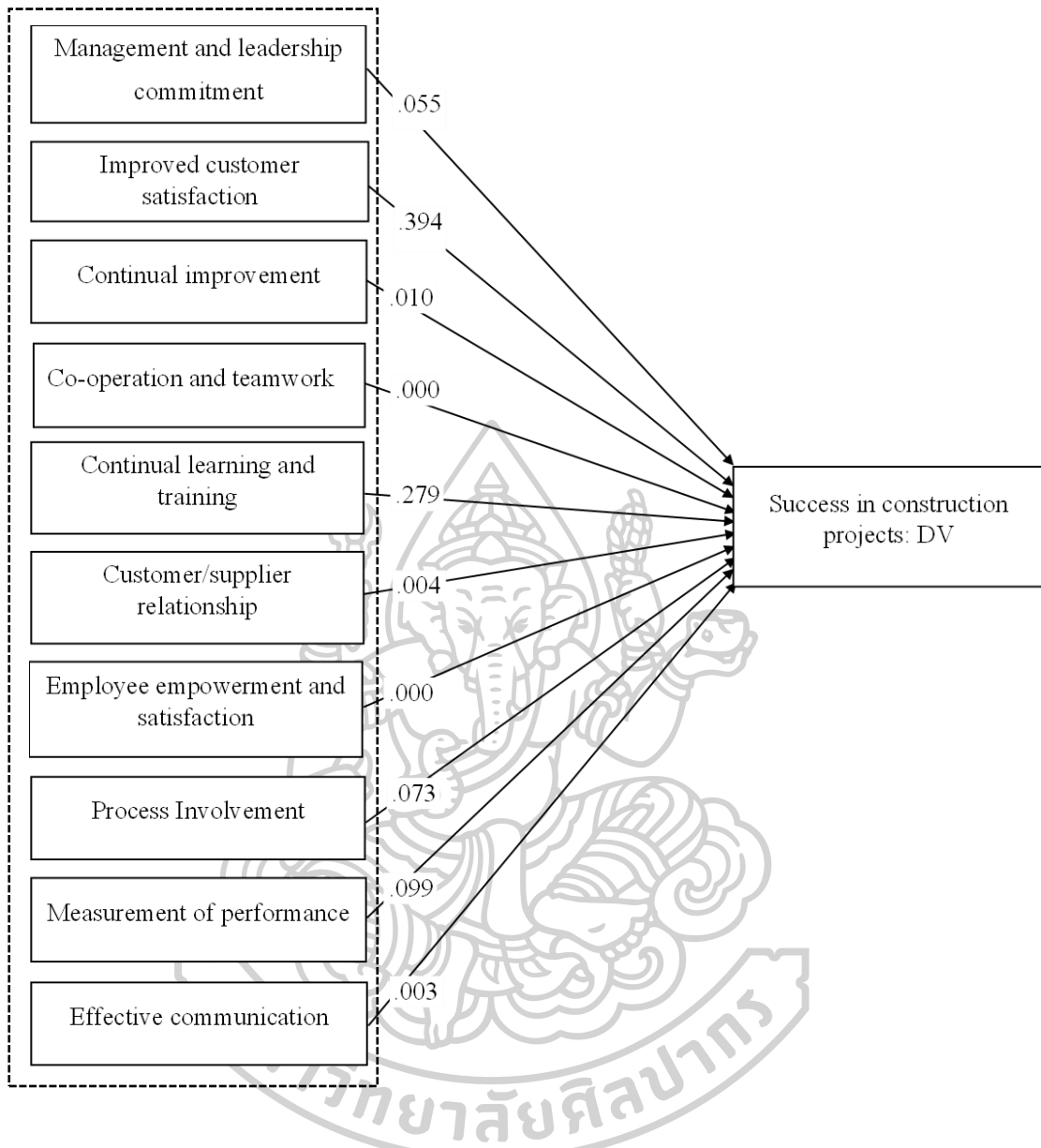
Figure 8 The output of the analysis of multiple regression technique.

Table 16 The result of multiple regressions analysis, total model of success of SMEs

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics			
	B	Std. Error	Beta			Partia	Part	Tolerance	VIF
(Constant)	3.529	.288	-	12.246	.000	-	-	-	-
Total TQM	.158	.067	.119	2.344	.020	.119	.119	1.000	1.000

Remark: a. Dependent Variable: success in the construction projects

R = 0.014; Adjust R Square = 0.012, F = 5.494, Sig = 0.020

Table 16, The study found that 12% of the total TQM variance is linked to success in construction projects for small and medium enterprises in Kunming. Total quality management implementation has ten elements explained factors as predictors of success in construction projects (R^2 = .012). In other words, the remaining 28.8% of successful construction projects were influenced by unexplained factors. This model is highly significant, as indicated by the F-value of F = 5.494 (p = 0.020 < 0.10).

4.3 Summary of Hypotheses Results

Based on the regression analysis, it was found that management and leadership commitment, continual improvement, co-operation and teamwork, customer/supplier relationships, employee empowerment and satisfaction, and total quality management implementation have a significant positive effect on the success of construction projects SMEs. In contrast, Improved customer satisfaction, continual learning and training, process involvement, measurement of performance, and effective communication have an insignificant effect on the success of construction projects SMEs. Therefore the nine hypotheses; H:1a, H:1c, H:1d, H:1f, H:1g, H:1h, H:1i, H:1j, and H:1k were accepted, however the five hypotheses; H:1b, and H:1e were rejected as indicated. A summary of the hypotheses has been explained previously in Table 17

Table 17 Summarization of hypotheses testing

Hypotheses		Result
H:1a	Management and leadership commitment had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1b	Improved customer satisfaction had a direct effect on successful construction projects of small and medium-sized enterprises	Rejected
H:1c	Continual improvement had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1d	Co-operation and teamwork had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1e	Continual learning and training had a direct effect on successful construction projects of small and medium-sized enterprises.	Rejected
H:1f	Customer/supplier relationships had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1g	Employee empowerment and satisfaction had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1h	Process Involvement had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1i	Measurement of performance had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1j	Effective communication had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted
H:1k	The total quality management implementation had a direct effect on successful construction projects of small and medium-sized enterprises.	Accepted

Research Objective 3. To study a model of the success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

The data analysis of eight factors related to the implementation of total quality management in construction projects of SMEs has revealed that certain factors have a greater impact on success than others. Based on the regression coefficient for raw scores, the following factors should be prioritized by business owners and branch managers: (1) Employee empowerment and satisfaction ($\beta = 0.220$) has the highest impact on project success, followed by (2) cooperation and teamwork ($\beta = 0.213$), (3) effective communication ($\beta = 0.170$), (4) customer/supplier relationship ($\beta = 0.163$) (5) process involvement ($\beta = 0.163$), (6) measurement of performance ($\beta = 0.111$), (7) management and leadership commitment ($\beta = 0.065$), and (8) improved customer satisfaction ($\beta = -0.033$). These factors have been found to significantly affect the success of construction projects of SMEs, as demonstrated in Fig. 9 The success model construction projects for small and medium-sized enterprises in Kunming.
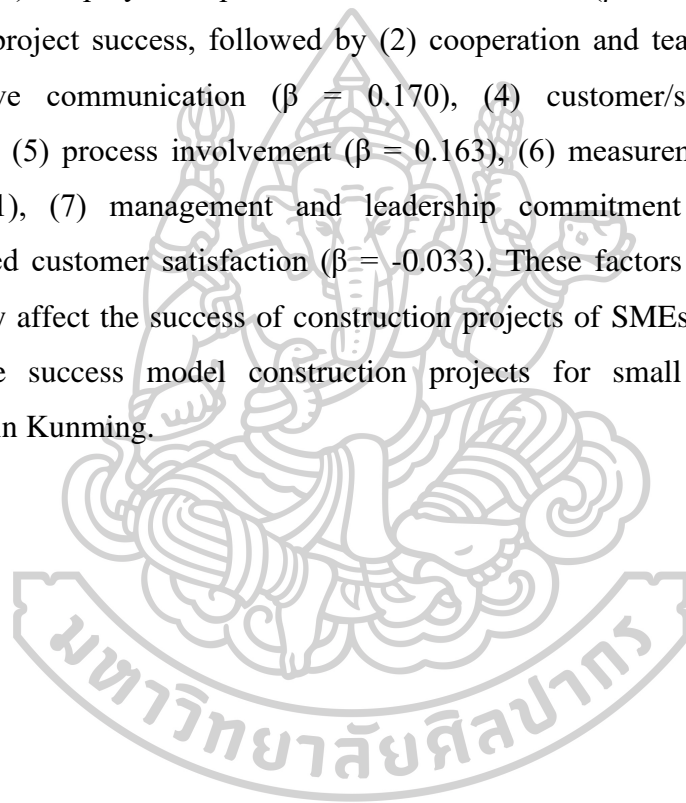
Figure 9 The success model construction projects for SMEs in Kunming.

CHAPTER 5

CONCLUSIONS

This final chapter will be covers the summary of this study and seeks to propose some recommendations for future studies that can be conducted to expand on this research.

5.1 The Results of Research Objective 1

To study the importance level of implementing total quality management and success in construction projects of small and medium-sized enterprises. The results of this study indicate that there are 10 components of total quality management, summarized in importance from the perspective of business owners or SMEs construction project managers as follows:

5.2.1 Management and leadership commitment is high important. The total average score was 4.13, with a standard deviation of 0.730. which indicates a high level of importance. When analyzing the factors, it was found that trust in staff and management commitment to the project were the most important factors, with a mean score of 4.19 and a standard deviation of 0.725. Following this, executives evaluating employees' performance fairly was also a significant factor, with a mean score of 4.11 and a standard deviation of 0.752. Lastly, it is important to prioritize dedication to management and leadership in order to bring about change at all levels of the organization, with a mean score of 4.08 and a standard deviation of 0.715.

5.2.2 Customer satisfaction improvement is high important. The total average score was 4.14, with a standard deviation of 0.661, indicating a high level of importance. Upon analyzing the importance level, it was found that the first important factor for our project is striving for continual improvement in work quality to ensure complete customer satisfaction, with a mean of 4.19 and a standard deviation of 0.610. The second factor is every employee in the organization is responsible for maintaining quality to ensure customer satisfaction, with a mean of 4.15 and a standard deviation of 0.720. Lastly, the company has a system to measure and track

service quality to ensure customer satisfaction, with a mean of 4.09 and a standard deviation of 0.652.

5.2.3 Continual improvement is very high importance. The total average score was 4.54, with a standard deviation of 0.508, which indicates a very high level of importance. Upon analyzing the data, it was concluded that when making decisions during continuous operations, it is crucial to consider and utilize numerical data and information as the primary factor, with a mean of 4.57 and a standard deviation of 0.495. The second most important factor is to focus on making corrections, improvements, and enhancing performance continuously, with a mean of 4.55 and a standard deviation of 0.519. Lastly, it is essential to emphasize the importance of the work process from the beginning to the end, with a mean of 4.49 and a standard deviation of 0.511.

5.2.4 Co-operation and teamwork are high important. The total average score was 4.18 with a standard deviation of 0.667, with indicates a high level of importance. Upon analyzing the importance level, it was concluded that the two factors had the same average value. Firstly, having skilled employees and promising project contractors is crucial, and collaboration with both internal and external networks should be prioritized. The mean for this factor is 4.19, with a standard deviation of 0.686 and a value of 0.614. Secondly, providing personnel with the opportunity to contribute suggestions and opinions for the betterment and growth of the organization is essential. The mean for this factor is 4.18, with a standard deviation of 0.701.

5.2.5 Continual learning and training are high important. The total average score was 4.16, with a standard deviation of 0.698, indicating a high level of importance. Upon analyzing the importance levels, it can be concluded that the most crucial factor is providing employee training when a company adopts new technology, with a mean score of 4.32 and a standard deviation of 0.660. The second most important factor is the work process focusing on continuous learning within the organization and the field, with a mean score of 4.10 and a standard deviation of 0.708. Lastly, consistently offering opportunities for learning and providing high-

quality training sessions for employees is also essential, with a mean score of 4.05 and a standard deviation of 0.725.

5.2.6 The customer/supplier relationship are high important, The total average score was 4.30, with a standard deviation of 0.708, indicating a high level of importance. Upon further analysis, it was concluded that the most important factor was placing emphasis on managing relationships with suppliers, particularly regarding their products or services, with a mean of 4.35 and a standard deviation of 0.699. Following this was the company analyzing customer and supplier needs before planning project implementation, with a mean of 4.30 and a standard deviation of 0.632. Lastly, the focus on continuously managing relationships with customers and other relevant parties was found to have a mean of 4.25 and a standard deviation of 0.743.

5.2.7 Employee empowerment and satisfaction are high important. The total average score was 4.32, with a standard deviation of 0.675, which is considered high. Upon analyzing the importance level, it can be concluded that the most important factor is having personnel who are fully committed and enthusiastic in their work, with a mean of 4.36 and a standard deviation of 0.634. Following this, offering employees the opportunity to utilize their expertise and skills effectively to meet service user needs is also crucial, with a mean of 4.31 and a standard deviation of 0.702. Finally, all departments should promote employee engagement by encouraging them to contribute to their work with a focus on quality and overall satisfaction, with a mean of 4.28 and a standard deviation of 0.688.

5.2.8 The process involvement are high important. The total average score was 4.28, with a standard deviation of 0.693, indicating a high level of importance. Upon analyzing the importance level, it was concluded that the company's focus on continuously improving work processes to align with evolving customer behaviors and needs was the most important factor, with a mean of 4.35 and a standard deviation of 0.684. The second most important factor was the coordination of activities throughout the entire work process, with a mean of 4.28 and a standard deviation of 0.670. The least important factor was the constant search for new ways to

improve and develop processes, with a mean of 4.21 and a standard deviation of 0.725.

     5.2.9 Measuring performance are very high important. The total average score was 4.51, with a standard deviation of 0.538. indicating a high level of importance. Upon analyzing the importance level, it was concluded that the factor found that our operating processes are designed to efficiently meet the needs of our customers is the most important, with a mean of 4.53 and a standard deviation of 0.554. Following this, the company has responsibility to both the organization and society at large was found to be the second most important factor, with a mean of 4.52 and a standard deviation of 0.545. Lastly, the performance of the construction project growth rate with the target was found to have a mean of 4.47 and a standard deviation of 0.515.

     5.2.10 Effective communication are high important. The total average score was 4.19, with a standard deviation of 0.685. indicating a high level of importance. Upon analyzing the importance level, it was concluded that the factor found to achieve job goals, it's importance in prioritizing both formal and informal communication, is the most important, with a mean of 4.27 and a standard deviation of 0.692. Following this, Holding a meeting to allow employees to share ideas, discuss work-related topics, and exchange information was found to be the second most important factor, with a mean of 4.16 and a standard deviation of 0.675. Lastly, the use of technology and applications is useful in facilitating communication between teams for convenience and speed was found to have a mean of 4.14, and a standard deviation of 0.686.

     5.2.11 The success in construction projects are high important. The total average score was 4.20, with a standard deviation of 0.636. indicating a high level of importance. Upon analyzing the data, it can be concluded that the most important factor for construction projects is expansion, with a mean of 4.22 and a standard deviation of 0.618. Following this, the value of the company's investments and the number of customers both showed an increase in importance, with a mean of 4.21 and a standard deviation of 0.644. The factor of operating productivity and warehouse size expansion had the same level of importance, with a mean of 4.20 and a standard

deviation of 0.651 and 0.645, respectively. Lastly, a reasonable share of cost saving and risk had a mean of 4.18 and a standard deviation of 0.621, respectively.

5.2 The Result of Research Objective 2.

To study the effect influencing total quality management implementation on successfully in the construction projects of SMEs in Kunming, the People's Republic of China. These findings suggest that employee empowerment and satisfaction had to regression coefficient for raw scores ($\beta = 0.220$), for standard scores (Beta) equal to .229, which have the highest impact on success in construction projects. It was found that the variable cooperation and teamwork had to regression coefficient for raw scores ($\beta = 0.213$), for standard scores (Beta) equal to .201. The variable customer/supplier relationship had to regression coefficient for raw scores ($\beta = 0.163$), for standard scores (Beta) equal to .178. The variable effective communication had to regression coefficient for raw scores ($\beta = 0.170$), for standard scores (Beta) equal to .169. The variable process involvement had to regression coefficient for raw scores ($\beta = 0.111$), for standard scores (Beta) equal to .108. The variable measurement of performance had to regression coefficient for raw scores ($\beta = 0.098$), for standard scores (Beta) equal to .097. The variable management and leadership commitment had to regression coefficient for raw scores ($\beta = 0.065$), for standard scores (Beta) equal to .061., and the variable continual improvement had to regression coefficient for raw scores ($\beta = -0.116$), for standard scores (Beta) equal to -.107.

Moreover, the adjusted R-Square value was (0.897), which indicated that the model's predictors explained 76.7% variation in the successful construction projects of small and medium-sized enterprises in Kunming. Total quality management implementation has ten elements explained factors as predictors of success in construction projects ($R^2 = .767$). ($p = 0.000 < 0.05$).

5.3 The Result of Research Objective 3

To study a model of the success in construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China.

The research result found that eight factors related to the implementation of total quality management in construction projects of SMEs have revealed that certain factors have a greater impact on success than others. Based on the regression coefficient for raw scores, the following factors should be prioritized by business owners and branch managers: (1) Employee empowerment and satisfaction (β = 0.220) has the highest impact on project success, followed by (2) cooperation and teamwork (β = 0.213), (3) effective communication (β = 0.170), (4) customer/supplier relationship (β = 0.163) (5) process involvement (β = 0.163), (6) measurement of performance (β = 0.111), (7) management and leadership commitment (β = 0.065), and (8) improved customer satisfaction (β = -0.033). These factors have been found to significantly affect the success of construction projects of SMEs, as demonstrated in Figure 4.3 The success model construction projects for small and medium-sized enterprises in Kunming.

5.4 Conclusion

To study the effect influencing total quality management implementation on successfully in the construction projects of small and medium-sized enterprises in Kunming, China. According to the results, all factors were deemed highly important. First, continual improvements had the highest mean at 4.54, followed closely by measurement of performance at 4.51. Employee empowerment and satisfaction received a mean of 4.32, while customer/supplier relationships and process involvement received a mean of 4.30, and 4.28. Co-operation and teamwork received a mean of 4.18, while continual learning and training and effective communication both received a mean of 4.16. Improved customer satisfaction received a mean of 4.14, and management and leadership commitment had the lowest mean at 4.13 respectively.

Results of multiple regression analysis findings that employee empowerment and satisfaction had to regression coefficient (β = 0.220), which has the highest impact on success in construction projects. Follow by cooperation and teamwork had a coefficient (β = 0.213), customer/ supplier relationship had a coefficient (β = 0.163), effective communication had a coefficient (β = 0.170), process involvement had a coefficient (β = 0.111), measurement of performance had a coefficient (β = 0.098) management and leadership commitment had a coefficient (β = 0.065) and continual improvement had a coefficient (β = -0.116) significant level at 0.10. Continuous learning and training, along with improved customer satisfaction, did not have a significant impact. This research is related to Jekiel's (2020), which concluded that establishing a continuous improvement process for daily task management is critical for personnel working towards organizational success.

In a successful model for construction projects, there are eight key factors that should be given priority. These include employee empowerment and satisfaction, cooperation and teamwork, effective communication, customer/supplier relationships, process involvement, performance measurement, management and leadership commitment, and improved customer satisfaction. According to the research conducted by Alawag et al.,2023), the success of construction projects depends on various elements. In addition, the leadership factor of the service provider is the most crucial. The other contributing factors also have a significant impact on the project's overall success. These findings are consistent with previous research.

5.5 Provide responses to research inquiries.

5.5.1 The research found that past performance of total quality management is crucial for successful construction projects in small and medium-sized enterprises in Kunming.

5.5.2 According to the research, there are 8 factors that influence the implementation of total quality management in construction projects of small and medium-sized enterprises in Kunming. However, except for the factors of improvement customer satisfaction and continual learning and training, there was no impact on the project.

5.5.3 The results of the research found that a model of successful construction projects of SMEs in Kunming, The success of construction projects depends on eight important elements that business owners or managers must be aware of in the long term. Project management is one of these elements.

5.6 Suggestions for Future Study

5.6.1 According to research, there are eight factors that affect the successful implementation of total quality management in SMEs construction projects. Some of these factors have a greater impact on success than others. It's important for business owners and managers to consider these factors as they provide valuable insights into industry challenges and opportunities. These insights can be used to create operational strategies for project collaboration and partnerships, including exploring the relationships between SMEs, subcontractors, and larger construction firms. Additionally, it's important to assess the impact of these relationships on project outcomes and business growth, as well as analyze the health and safety practices of SMEs in construction. This includes accident prevention, compliance with safety regulations, and the impact on project timelines and costs.

5.6.2 Researching certain topics can offer valuable insights into the operations and obstacles that SMEs encounter during construction projects. This can ultimately aid in the creation of effective total quality management strategies that facilitate their growth and success. Researchers have the flexibility to select topics that align with their interests and knowledge, allowing them to make a significant contribution to the field.

5.7 Implications

The impact of small to medium-sized enterprise (SMEs) construction projects in China can differ greatly based on various factors such as the project's size, location, governmental policies, and the specific capabilities and practices of individual SMEs. To maximize the positive outcomes and minimize the negative consequences, effective regulations and support mechanisms are necessary. These projects can create job opportunities, particularly in rural and less developed regions, which can

contribute to reducing poverty and increasing income. Additionally, SMEs may develop innovative sustainable construction practices and technologies that can help to decrease environmental impact.

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APPENDIX

Online Questionnaire

Research Title

The Effect Influencing Total Quality Management Implementation Successfully
in the Construction Projects
of Small and Medium-Sized Enterprises in Kunming,
The People's Republic of China

This questionnaire is divided into three parts, which are as follows:

Part 1. Demography

Part 2 . To study the important level of total quality management and implementation successfully in Construction Enterprises in Kunming, the People's Republic of China.

Part 3. Suggestion

Please respond to all items

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Instruction: Please tick (✓) in the ☐ that represents the fact.

Part 1: Demography of owners' construction projects of small and medium-sized enterprises**.**

1. Gender 1.☐ Males   2.☐ Females

2. Age   1.☐ 30 Years or under   2.☐ 31 – 40 Years

           3.☐ 41 – 50 Years   4.☐ 51 – 60 Years

           5.☐ 60 Years or older

3. Status

       1.☐ Single   2.☐ Merrit

       3.☐ Separated   4.☐ Divorce

4. Education

       1.☐ Below Bachelor Degree   2.☐ Bachelor's Degree

       3.☐ Master's Degree   4.☐ Doctoral Degree

       5.☐ Other (Please specify)..

5. Position

       1.☐ Owner   2.☐ Manager

6. Investment in a business

       1.☐ Individual investors

       2.☐ Individual investors and family offices

       3.☐ Individual investors and corporate investors

       4.☐ Individual investors, corporate Investors, and financial institution

       5.☐ Individual investors and financial institution

       6.☐ Other (Please specify)........................

7. Number of employees

       1.☐ Fewer than 1,000   2.☐ 1,001-2,000

       3.☐ 2,001-3000   4.☐ 3001 or More

8. Age of the company

       1.❏ Less than 5 years   2.❏ 5-10 Years   3.❏ 11-15 Years

       4.❏ 16-20 Years   5.❏ 21 Years or More

9. Types of construction projects

       1.❏ Residential or housing   2.❏ Industrial

       3.❏ Commercial   4.❏ Civil works for public utilities

       5.❏ Other (Please specify)..................

10. Size of construction projects

       1.❏ Large-sized   2.❏ Medium-sized

       3.❏ Small-sized   4.❏ Mini-sized

11. Past performance

     1.❏ Reduce   2.❏ Fixed   3.❏ Better

12. Construction project income (Including work of all systems)

       1.❏ Fewer than 30 million yuan   2.❏ 30-70 million yuan

       3.❏ 71-110 million yuan   4.❏ 111-500million yuan

       5.❏ 501 million yuan or more

Part 2. To study the opinion level of total quality management implementation successfully in the construction projects of small and medium-sized enterprises in Kunming, the People's Republic of China

Instruction: Please tick (✓) in the columns that represent the fact.

Question (Total Quality Management: IV)	Level of Implementation				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
1. Management and leadership commitment					
Project execution requires trust in the staff and a sense of management commitment to the project.					
Executives evaluate employees' performance fairly.					
Focus on the importance of prioritizing a dedication to management and leadership in order to bring about change throughout all levels of the organization.					
2. Improved customer satisfaction					
2.1 Our project strives for continual improvement in work quality to ensure complete customer satisfaction.					
2.2 The company has a system to measure and track service quality to ensure customer satisfaction.					
2.3 Every employee in the organization is responsible for maintaining quality to ensure customer satisfaction.					

Question (Total Quality Management: IV)	Level of Implementation				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
3. Continual improvement					
3.1 Emphasize the importance of the work process from the beginning to the end of the process.					
3.2 When making decisions during continuous operations, it's important to consider and use numerical data and information.					
3.3 Focus on continuously working on making corrections, improvements, and enhancing our performance.					
4. Co-operation and teamwork					
4.1 The company boasts of having skilled employees and a pool of promising project contractors.					
4.2 It is important to prioritize collaboration with networks, both internal and external to the project.					
4.3 Provide personnel with the opportunity to contribute suggestions and opinions for the betterment and growth of the organization.					

Question (Total Quality Management: IV)	Level of Implementation				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
5. Continual learning and training					
5.1 Focus on the importance of consistently offering opportunities for learning and offering high-quality training sessions for employees.					
5.2 The work process focuses on continuous learning in the field and across the organization.					
5.3 When a company implements new technology into their work, employee training is provided.					
6. Customer/supplier relationship					
6.1 The company analyzes customer and supplier needs before planning project implementation.					
6.2 Focus on the importance of continuously managing relationships with customers and other relevant parties.					
6.3 Emphasis importance on managing relationships with suppliers, particularly regarding their products or services.					

Question	Level of Implementation				
(Total Quality Management: IV)	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
7. Employee empowerment and satisfaction					
7.1 Offer employees the opportunity to utilize their expertise and skills to meet service user needs effectively.					
7.2 All departments promote employee engagement by encouraging them to contribute to their work with a focus on quality and overall satisfaction.					
7.3 All personnel who are fully committed and enthusiastic in their work.					
8. Process Involvement					
8.1 The company prioritizes continuous improvement of work processes to align with evolving customer behaviors and needs.					
8.2 Many people constantly seek new ways to improve and develop their processes.					
8.3 Activities are coordinated throughout the entire work process.					

Question (Total Quality Management: IV)	Level of Implementation				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
9. Measurement of performance					
9.1 Our operating processes are designed to efficiently meet the needs of our customers.					
9.2 The performance of the construction project growth rate with the target.					
9.3 The company has a responsibility to both the organization and society at large.					
10. Effective communication					
10.1 To achieve job goals, it's important to prioritize both formal and informal communication.					
10.2 Hold a meeting to allow employees to share ideas, discuss work-related topics, and exchange information.					
10.3 The use of technology and applications is useful in facilitating communication between teams for convenience and speed.					

Question (Total Quality Management: IV)	Level of Implementation				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
11. Success in construction projects: DV					
11.1 Reasonable share of cost saving and risk					
11.2 Operating productivity					
11.3 The value of the company's investments and the number of customers has both increased.					
11.4 The warehouse size has been expanded.					
11.5 Construction projects are expanding.					

Part 3 Suggestion about quality management implementation successfully in the construction projects of small and medium-sized enterprises in Kunming,

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VITA

NAME   Kaixiang SHI