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## Significant factors to motivate small and medium enterprise (SME) construction firms in the Philippines to implement ISO9001:2008

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### Abstract

Motivating SME-based construction firms to adopt different management systems is not a simple task, especially if they are not aware of the benefits that they will gain from the new process-based management system. The implementation of ISO 9001:2008 Quality Management System in the construction industry is an ongoing trend, more so in the Small and Medium Enterprise. However, the level of awareness and readiness of the construction industry in the Philippines is still low as compared to the neighboring countries in Asia and in the western countries where ISO 9001:2008 originated. The purpose of this research is to determine the significant factors that will motivate SME-based construction firms in the Philippines to implement ISO 9001:2008. A field study was conducted on SME based construction firms in the Philippines, wherein a total of 139 respondents out of the 613 SME-based construction firms in CALABARZON areas were surveyed. Results reveal that the three main factors that will motivate SME-based construction firms to implement ISO 9001:2008 are (1) if required by their clients, (2) to qualify for bidding and (3) to increase customer satisfaction. Therefore, based on the results and findings, a certification of ISO 9001:2008 from an accredited auditor shall be required by clients as a constituent in accrediting SME-based construction firms and to qualify for bidding.

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**Keywords:** ISO 9002:2008; Quality Management Systems (QMS); Small Medium Enterprise (SME).

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## 1. Introduction

Construction infrastructure projects are one of the most important factors in supporting the social economic development in the country. It could generate downstream economic activities and completely enhance productivity and competitiveness in the construction industry. Considering the significance of the construction industry in the economic growth, it is necessary to identify major issues affecting the efficiency of its sector. The main objectives of any project are improvements in time, cost, and quality [1]. In order to implement an infrastructure project effectively and efficiently the construction enterprise must adopt a management system that will guide them to ensure that projects are successfully completed within the constraints of best quality, on time, and at the minimum possible cost [2]. As building projects get larger and more complex, clients are also increasingly demanding higher standards for their delivery [3]; therefore, the need for a quality management system becomes more of a necessity than just a requirement.

According to Mohammed and Abdullah [4], QMS is the interaction of people, process, and documentation to meet the customer's stated and implied needs. The result would be a reduction in inefficiencies and waste, improved work practices, increased morale of the management team, and the opportunity for a greater market share. ISO 9000 is a series of international standards which sets out requirements and recommendations for the design and assessment of management systems. ISO 9000 is grounded on the "conformance to specification" definition of quality. The standards specify how management operations shall be conducted. ISO 9000's purpose is to ensure that suppliers design, create and deliver products and services which meet predetermined standards; in other words, its goal is to prevent non-conformity [5]. ISO 9000 certification in the construction industry has been widely accepted in many countries, and the number of certifications for general, heavy and specialty contracting companies is growing considerably. Some investigators associate ISO 9000 with multiple advantages and with positive changes in internal procedures of construction firms [6]. Yet others argue that these standards do not apply directly to the construction industry and cannot be associated with a substantial improvement in the delivery of a quality construction product.

There are at least 2,536 listed construction companies in the Philippines as of 2009, out of which 2,409 belong to the Small and Medium Enterprise or better known as the SMEs (Industry and Trade Statistics Department, 2009). SMEs play a crucial role in the development of the Philippine economy. They represent 99.6 percent of all businesses registered in the country and employ 70 percent of the total labor force. In addition, they account for 32 percent of the country's gross domestic product (GDP) [7]. In China, the SMEs are the core of the construction industry development and play main role in the urban and rural building [8].

### 1.1. Research objective

The main objective of this study is to identify the significant factors that will motivate the SME-based construction firms in the Philippines to implement ISO 9001:2008 in their organization. There is still no specific data or information regarding the present condition on the implementation of ISO 9001:2008 in the construction industry in the Philippines, moreover to the SME construction firms in the CALABARZON area. This research was a proactive attempt to the Department of Public works and Highways (DPWH) memorandum that will require SME construction firms to be ISO 9001:2008 certified as part of the requirement in the eligibility or prequalification of contractors in the near future.

### 1.2. Scope and limitation

The study was limited to category A, B, C, and D construction firms based on the accreditation standards of Philippine Contractors Accreditation Board (PCAB). These contractors belong to the SME-based contractors according to size of assets and number of employees. The SME-based contractors in CALABARZON (Cavite, Laguna, Batangas, Rizal and Quezon provinces) were selected from the total list of licensed contractors listed by PCAB as of April 27, 2012.



### 1.3. Definition of terms

CALABARZON comprises provinces in Region IV-A in the Philippines composed of Cavite, Laguna, Batangas, Rizal and Quezon provinces, where the study was conducted.

Contractors are companies engaged in building infrastructure projects.

DPWH or Department of Public Works and Highways is the engineering and construction arm of the Philippine Government tasked to continuously develop its technology for the purpose of ensuring the safety of all infrastructure facilities and securing the highest efficiency and quality in construction for all public works and highways.

ISO (International Standard in Organization) is an international standard to provide the generic core of a quality system standard applicable to a broad range of industry and economic sector.

PCAB or Philippine Contractors Accreditation Board is the accrediting agency of the Philippines authorized to give contractors licenses with respective category level to practice construction business in the Philippines.

Quality Management System is comprised of activities of the overall management function that determine the quality policy, objectives, and responsibilities of the Company. It is implemented through quality planning, quality control, quality assurance, and quality improvement.

SME or Small and Medium Enterprise is any business activity or enterprise engaged in industry, agri-business/services, whether single proprietorship, cooperative, partnership, or corporation, whose total assets value is between 3 million to 15 million for Small and 15 million to 100 million for Medium enterprise.

## 2. Review of related literature

The Quality Management System for the Construction Industry is a systematic approach for the companies who want to develop and establish a quality system. The QMS gives guidelines to the introduction, structure, and contents of quality systems for the use of all parties involved in the construction industry [9]. According to the original 1987 bulletin from the International Organization for Standardization (ISO), ISO 9000 is "a series of international standards dealing with Quality systems that can be used for external quality assurances purposes."

The ISO was founded in 1946 to develop international quality standards to facilitate worldwide trade and help Western countries regain their competitiveness. The organization consists of a coordinating group of members from more than 90 countries. The U.S. representative is the American National Standards Institute [10].

Many companies throughout the world are trying to obtain an ISO 9001:2000 Quality Management Systems certification to demonstrate to their customers that they are capable of meeting their needs and expectations. For instance, a report on ISO 9000 certifications showed that 500,125 companies worldwide had attained ISO 9001 certification by the end of December 2003 [11].

The acceptance of ISO 9000 standards in the construction industries is not as wide as in other industries such as manufacturing. There are special features in the construction industry that limit the implementation of the ISO 9000 standard. One of these features is that a construction project is usually a unique collection of people, equipment, and materials brought together at a unique location under unique weather conditions, while most manufacturing is a system of mass production wherein all of these factors are consistent with producing typical products over and over again [12].

Over the years, according to Said et al. [2], QMS application systems in the Malaysian Construction Industry have been on an increasing trend. Currently, there are more than 4,000 QMS certified organizations as compared to when it was first introduced in 1987. So far, QMS has brought about positive changes in the Malaysian Construction Industry. However, the industry is still facing problems in the implementation of QMS. From the findings of their research, four main advantages have been identified. They are (i) organization image and reputation enhancement, (ii) performance and customers' satisfaction improvement, (iii) documentation procedures and instructions establishment, and (iv) constant quality service.

The success of the ISO 9000 family of standards is still growing and the number of countries where ISO 9000 is being implemented has increased. Over 400,000 companies in 158 countries have identified the ISO 9000 standard as a strategic management tool essential to effective control and best business practice. The construction industry has embraced the ISO 9000 standard since its inception. The Quality Management standard has become the



benchmark for successful construction companies. The discipline and systematic approach has helped many companies to structure their management and processes to consistently meet the client's requirements [6].

In the United Kingdom, some of the construction industry clients made it compulsory that the contractors implement ISO 9001:2008 Quality Management System in their organizations to qualify for participating in the bids [13]. As a result, a tremendous impact was observed with more and more contractors seeking for ISO certification. Consequently, marketing and customer's insistence have become the key factors driving the ISO implementation.

In the Philippines, based on the initial study conducted on the level of awareness on ISO 9001:2008, results showed that most of the SME-based construction firms in the Philippines were not aware of the implementation of ISO 9001:2008. There is a strong implication that the initiatives of the construction industry in training, exposing, and actual learning to SME construction firms are low, which affected their level of awareness [14].

Micro, small, and medium enterprises (MSMEs) are defined as any business activity or enterprise engaged in industry, agri-business/services, whether single proprietorship, cooperative, partnership, or corporation, whose total assets, inclusive of those arising from loans but exclusive of the land on which the particular business entity's office, plant and equipment are situated, must have value falling under the following categories: By Asset Size, Micro: Up to P3,000,000; Small: 3,000,001 - P15,000,000; Medium: P15,000,001 - P100,000,000; Large: above P100,000,000 [15].

Based on the study conducted by the Philippine Institute for Development Studies, Small and Medium Enterprises (SMEs) have played an important role in industrial production in particular, and economic growth in general in less developed, developing, and transitional economies worldwide [16]. They have generally provided the bulk of entrepreneurs and employment in these economies, and the necessary foundations for sustained economic growth and rising incomes. The SMEs are the core of the construction industry development and play a main role in the urban and rural building. With the professional subdivision, the increase of professional ability, and the improvement of project sub-contract system in the construction industry, the roles of the Industry Cluster of SMEs will become more and more obvious, including stabilizing economic development, enlarging employment rate in the towns, and promoting technology innovation [8].

### 3. Methods

#### 3.1. Research design

A descriptive method of research was used in the study, wherein the principal aim was to describe and interpret the data collected. It is concerned with conditions of relationships that exists; practices that prevail; beliefs, processes that are going on; effects that are being felt or trends that are developing. In this study, it was intended to identify the significant factors to motivate SME contractors to implement ISO 9001:2008 QMS in their organization.

#### 3.2. Research locale

At the regional level, the largest number of construction projects were located in CALABARZON, according to the Private Building Construction statistics of the fourth quarter of 2011. It was therefore decided by the researcher to limit the study to SME-based construction firms in the CALABARZON areas.

#### 3.3. Population and sampling

The respondents of the study were the operational managers or supervisors and company owners of SME-based construction firms in the CALABARZON area as shown in Table 1. To come up with the desired sample size, total population of 613 SME-Based contractors in CALABARZON were extracted out of the total list of 5,573 licensed contractors listed by Philippine Contractors Accreditation Board (PCAB) as of April 27, 2012.





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Table 5. Level of significance of motivating factors in implementing ISO9001:2008

Factors	DESCRIPTION
1. To qualify for Bidding	Very Significant
2. If required by clients(gov't/or private)	Very Significant
3. To increase employee productivity	Moderately Significant
4. To reduce customer complaints	Moderately Significant
5. To increase profit margins/lower operational cost	Moderately Significant
6. To improve company image	Moderately Significant
7. To increase customer satisfaction	Moderately Significant
8. To deliver projects on schedule/reduce delays	Slightly Significant
9. To use resources more efficiently/reduce wastage	Least Significant
10. Others	

In all three (3) provinces of Cavite, Laguna, and Batangas, the factor that will motivate them to implement QMS ISO 9001:2008 is if it is required by clients. In Quezon province the main factor that will motivate them to implementing ISO 9001:2008 is to increase their customer satisfaction. Improving company image is the main factor among firms in Rizal province that will motivate them to implement ISO 9001:2008 as shown in Table 6.

Table 6. Significant factors to motivate SME-based Construction firms to implement ISO 9001:2008 per provinces

Factors	PROVINCES					MEAN
	Cavite	Laguna	Batangas	Rizal	Quezon	
1. To qualify for Bidding	3.00	2.73	2.14	3.13	2.30	2.48
2. If required by clients(gov't/or private)	1.33	1.95	2.05	3.64	2.63	2.33
3. To increase employee productivity	3.25	4.00	3.36	2.56	3.64	3.19
4. To reduce customer complaints	2.25	3.43	4.13	3.61	3.63	3.29
5. To increase profit margins/lower operational cost	4.67	2.28	3.50	2.89	3.75	3.11
6. To improve company image	3.62	2.62	3.17	2.33	3.57	2.99
7. To increase customer satisfaction	1.64	2.85	3.59	2.56	1.82	2.64
8. To deliver projects on schedule/reduce delays	4.33	3.85	4.55	3.55	3.00	3.81
9. To use resources more efficiently/reduce wastage	4.33	4.62	4.00	4.22	3.17	4.21

## 5. Conclusion and recommendation

SME-based construction firms are all represented according to company profile factors, such as PCAB category, type of business, asset size, no. of employees, years of operations, and type of construction services in this study. Among the listed factors, there are only two very significant factors that will motivate SME-based construction firms to implement ISO 9001:2008. (1) If it will be required by their clients and (2) in order to qualify for bidding. Most of the factors fall under moderately significant and the least significant factor is to use resources more efficiently to reduce wastage.

In the application of construction projects, the effective and common application of QMS particularly in developing countries, such as the Philippines, may reduce problems like the lack of supervision and standardization in construction activities.

In the global construction market, an increase in the number of firms having QMS will reduce both the project costs and develop the potential of awarding contracts to the construction firms from underdeveloped or developing countries.



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Taking into consideration the literature review and questionnaire results, the following recommendations have been formed for effective application of ISO 9001:2008 QMS in construction firms and for future research:

- Government and private clients should make it compulsory for SME-based construction firms to be ISO 9001:2008 certified by accredited auditors to qualify for bidding in their construction projects.
- Activities like explaining the importance, advantages and benefits of QMS for SME-based construction firms in the construction industry, granting incentives for the application of QMS, and even granting credit facilities for firms to set up the system will be encouraged.
- Government agencies involved in the construction industry should coordinate with private developers and construction firms to conduct seminars and trainings that will focus on the advantages and benefits of ISO 9001:2008 in their organization.
- More comprehensive studies must be carried out with consideration to other industries rendering service to the construction industry, such as the Construction materials industry, by treating the construction industry in Philippines on a broader scope.

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## Development of a training Program towards an Effective Safety Practices

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**Abstract:** The construction industry is one the most accident-prone work fields in the world. According to Balan Nair Asia-Pacific Regional Representative, safety is a major problem in the construction industry in the Philippines. In addition thereto, safety issues arise as the biggest factor in the most fatal work-related accidents occurring in the construction. Given so, it shall be ensured that the workers are competent enough as they struggle in the rigors and possible encounters in the field. Trainings and seminars are some of the key activities to hone and develop a competent safety practitioner. Thus, with a competent Safety Practitioner, achieving zero incident and free from all illnesses is possible. The presence of competent Safety Practitioners is one of the key factors to maintain the working environment with "zero accident/illnesses". The study aims to develop a training program towards safety practices and seeks to assess the level of effectiveness of Safety Practitioners in selected Construction Companies as the basis for the development of a training program.

**Keywords:** PUP; OSH Standards; Safety Practitioner; Safety Training Program; Safety Practices.

### I. INTRODUCTION

Since construction is on the upswing due to the demand of development, safety has been subject of many tragedies, studies, debates and improvements. It is undeniable that construction is everywhere since it is the one of the many priorities of both the private and public sectors of the Philippines. It has also been public knowledge that construction involves many people engaged in various activities. To some, construction is as easy creating a block of building but many are not aware of the risky situations that workers might experience, most especially when handling construction equipment.

Today, as technology improves and safety practices procedures are updating, the working environment in our country is safer than it has ever been before. Does having a competent safety practitioner the prime reason for establishing a safe work environment?

Safety Practitioners are the people responsible for the assurance of implementing the acceptable levels of safety standards. Their primary goal is to manage, eliminate and reduce risks. They monitor the work environment, inspect buildings and machines, and implement safety features. The severity of a failure may result in fatalities, injuries, property damage and loss of money. Safety Practitioners reduce the frequency of failure and ensure that the consequences are not life threatening.

Accidents are investigated to determine its cause and prevention. Safety practitioners ensure that new equipment's are safe to operate. Also, safety practitioners propose safety clothing appropriate in the activities and devices to protect workers from injuries.

Specialization in this field of engineering has developed considerably over many years. There are now more available safety practitioners in the construction industry than before. Despite this, little are known about the value of Safety Practitioners.

Some countries are in the process of developing safety standards for workers. This systematic review was made to analyze the research evidence on the competencies of Safety Practitioners in order to gain a deeper understanding of its effects.

### II. RESEARCH METHODOLOGY

This study used descriptive survey method. This method was used to qualitatively describe the assessment scores obtained from all respondents. The study involved the construction of the survey questionnaires and subjected to various procedures to ensure the validity and reliability of the evaluation instrument. In order to draw the data needed to answer the specific problems in the study, the researcher utilized survey questionnaire as its data gathering instruments. The primary data were derived from the answers of the two group respondents during survey process. The survey questionnaire was divided into two main parts; (I) a profile and the (II) survey proper. The survey questionnaire was separately constructed for the (A) Safety Practitioners and (B) Project Managers/Immediate Head. The profile contains socio-demographic characteristics of the respondents such as role in the company, age and as well as the number of years of experience. The survey proper was divided into multiple parts categorized as (1) Present Job Duties / Safety and Health Practices (2) Business Knowledge (3) Management Competencies and (4) Personal Credibility. The following statistical treatment were used to interpret the results on the level of effectiveness of safety practitioner of this study; Frequency and Percentage Analysis, Weighted Mean, Likert 5 Point Scale with 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often and 5 = Always applied.



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### III. RESULTS AND DISCUSSION

#### A. Profile of Respondents

Background information on respondents' profile shows that 65.91% of the respondents were safety practitioners and 34.09% were project managers / immediate head. In terms of Age, 15 safety practitioners or 34.09% of the respondents' age was from 26-35 and below 25 with no project manager. In terms of years of experience in practicing safety, 15 safety practitioners or 34.09 % of the respondents from 2 - 5 years, and no safety practitioners had more than 10 years of experience. From the above- mentioned, it can be determined that the respondents could depend on the information provided for this study for the purpose of analysis.

Department of Labor and Employment Order No. 16, Series of 2001, state that the basis of being an accredited Safety Practitioners in the Philippines is under the Rule 1030 of the Occupational Safety and Health Standards [5].

Table 2. Frequency and Percent Distribution of the Respondents - in terms of Age

Age	Safety Practitioner		Project Manager/ Immediate Head	
	Frequency	%	Frequency	%
Below 25	4	9.09%	0	0.00%
26 – 35	15	34.09%	3	6.82%
36 – 45	9	20.45%	7	15.91%
46 and above	1	2.27%	5	11.36%
Total	29	65.91%	15	34.09%

Table 3. Frequency and Percent Distribution of the Respondents

Years of Experience	Safety Practitioner		Project Manager/ Immediate Head	
	Frequency	%	Frequency	%
Below 2	11	25.00%	1	2.27%
2 – 5	15	34.09%	4	9.09%
6 – 10	3	6.82%	8	18.18%
11 and above	0	0.00%	2	4.55%
Total	29	65.91%	15	34.09%

- in terms of Years of Experience

#### B. Level of Effectiveness of Safety Practitioner

This study was anchored on the concept introduced by Ng Cheuk Ping (1999) on his study there are four domains of Registered Safety Officers competencies, namely Safety and Health Practices, Business Knowledge, Management Competencies, and Personal Credibility [11]. Tables were based on the mentioned domains.

As per Al-Kilani's article during the year 2011, the contractors have to train the workers, promote the safety culture, and follow-up the safety performance [1].

Present Job Duties (Safety and Health Practices) by Role/Position in the Company according to Age in practicing safety were all often applied. The competency of Identify/evaluate/control risks at work got the highest general weighted mean of 4.93. On the other hand, competency of Conduct of Safety Audits got the lowest general weighted mean of 3.53. And, Present Job Duties (Safety and Health Practices) by Role/Position in the Company according to Years of Experience in practicing safety were all often applied. The competency of Identify/evaluate/control risks at work got the highest general weighted mean of 4.93. On the other hand, competency of Conduct of Safety Audits got the lowest general weighted mean of 3.07.

Business Knowledge by Role/Position in the Company according to Age in practicing safety was all sometimes applied. And, Business Knowledge by Role/Position in the Company according to Years of Experience in practicing safety were all sometimes applied.

Management Competencies by Role/Position in the Company according to Age in practicing safety were all often applied. The competency of Exchange information to solve problems and make decisions got the highest general weighted mean of 4.33. On the other hand, competency of Recruit and select personnel got the lowest general weighted mean of 2.60. And, Management Competencies by Role/Position in the Company according to Years of Experience in practicing safety were all often applied. The competency of Exchange information to solve problems and make decisions got the highest general weighted mean of 4.33. On the other hand, competency of Recruit and select personnel got the lowest general weighted mean of 2.33.

Personal Credibility by Role/Position in the Company according to Age in practicing safety were all often applied. The competency of In-still confidence in self and others got the highest general weighted mean of 4.48. On the other hand, competency of Provide alternative insights on business issues got the lowest general weighted mean of 3.52. And, Personal Credibility by Role/Position in the Company according to Years of Experience in practicing safety were all often applied. The competency of In-still confidence in self and others got the highest general weighted mean of 4.48. On the other hand, competency of Provide alternative insights on business issues got the lowest general weighted mean of 3.47.

Jackson et al. (2004) suggest that the protection of emergency responders should follow a safety management cycle, and those responsible for safeguarding emergency workers must always weigh up whether deploying emergency workers is sufficiently beneficial or otherwise. Safety practices and accident prevention to help safety personnel and management reduce injuries and fatalities at work. Based from the related materials perused no study was found that focused on developing a training program except for journals on competencies. If appropriate training was given to Safety Practitioners, they become competent doing their jobs. Having competent workers is a key to having a safe work



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environment and achieving zero accidents / illnesses. This study will help to develop training programs for Safety Practitioners to boost their skills and abilities.

Table 3. Level of Effectiveness of Safety Practitioners

Four Domain of Competencies	Weighted Mean	Verbal Interpretation
Safety Health and Practices	4.36	Often
Business Knowledge	3.20	Sometimes
Management Competencies	3.73	Often
Personal Credibility	4.06	Often

#### IV. CONCLUSION

With the use of the survey instruments developed in this study, data were collected which addressed the research problems posed by this study. After crucial analysis and interpretation of the various data, the following conclusions were drawn: majority of the respondents were Safety Practitioners, 26-35 years old, and with an experience in safety practices in 2-5 years. Level of effectiveness of Safety Practitioner, when grouped according to profile, it is considered that: *Identify/ evaluate/ control risks at work* is the most significant among the *Personal Job Duties (Safety Health Practices)* section; by the extent to which the two respondents agreed that *Business Knowledge* is necessary; *Exchange information to solve problems and make decisions* has the highest rating among the *Management Competencies*; the competency in *Meeting commitments* is the most important factor among *Personal Credibility*; competency of *Conduct of Safety Audits* got the lowest general weighted mean of 3.53 in the category of *Present Job Duties (Safety and Health Practices)*, meaning the category is considered as sometimes applied by the Safety Practitioners. The abovementioned competency needs enhancement.

According to Sylge, C, (1995), a personal programme of training needs to be built up by an individual as part of their working life – it is not pre-planned by the organization [13]. The course shall help the safety practitioner effectively audit construction safety operational and safety management systems. Also, the course will teach them recommend possible solutions and sought agreement on corrective actions in construction safety.

It is therefore recommended to have a program/training that will enhance the construction safety- auditing course of a Safety Practitioner or create another training related to construction safety auditing course.

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