



Effectiveness of Integrative Application of Quality Management Systems with Productivity and Quality Improvement Tools in Businesses

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Abstract. Within the scope of Program 712, in 2020, Directorate for Standards, Metrology and Quality – Ministry of Science and Technology cooperated with Asia Management Consulting and Business Development Company Limited to perform the research on “replicating the application of management systems combined with productivity and quality improvement tools as appropriate for small and medium-sized businesses in Vietnam”. The methodology used in this research includes the construction of integration models; selecting businesses suitable to set up the application of appropriate management systems and productivity and quality improvement tools; guiding businesses to apply management systems and productivity and quality improvement tools successfully, and taking the survey to test the effectiveness of models application. The results show that applying management systems and productivity and quality improvement tools increases effectiveness in all 30 businesses, 14 recorded a 7.5–25% increase, and 16 recorded 25–41%. All 30 businesses show improvement in discipline, manners, and attitude in work, as well as improvement in awareness of management systems and productivity and quality improvement tools. However, there remain existing difficulties arising from businesses’ finance and scale situation, like not having a specialized position in charge of system management or productivity and quality improvement projects, or well-trained specialist quitting, weakening the effectiveness of the system.

Keywords: Quality Management System · Vietnam Business · Productivity and Quality Improvement Tools · Model · Effectiveness

1 Introduction

Management systems following international standards of International Organization for Standardization (ISO), and productivity and quality improvement tools are the perfect models for an organization to achieve high performance as well as continuously innovate and raise its standing in the global competition. After decades of implementation, the number of organizations that recognize and employ management systems and productivity and quality improvement tools grows.

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E. H. Saragih et al. (Eds.): APMRC 2022, AEBMR 221, pp. 529–536, 2023.

https://doi.org/10.2991/978-94-6463-076-3_42

According to ISO annual survey [1], 1,307,622 ISO certificates were issued in 2018 by certification bodies accredited by International Accreditation Forum (IAF). Among those, ISO 9001 standards quality management system had 878,664 certificates; ISO 14001 standards environmental management system had 307,059; ISO/IEC 27001 standards information security management system had 31,910, and ISO 22000 standards food safety management system had 32,120. These are the top 5 management systems with the most certificates globally in 2018.

Apart from international standards management systems, various organizations also employ tools to improve productivity, with some typical examples being abiding by the 5S, maintaining Total Productive Maintenance (TPM), adopting Lean production, and applying incremental innovations tool Kaizen, Key Performance Indicator (KPI) tool and 7 Quality Control tool, etc. Each tool brings its benefits to businesses. Together, they help promote improvement to production procedures, eliminate defects, and reduce unnecessary waste, thereby improving the quality of products and goods and increasing productivity, meeting customers' demands, and contributing to affirming the businesses' standing and reputation in the market [2].

The concurrent application of productivity and quality improvement tools and quality management systems provides significant benefits to the units doing so. Therefore, applying productivity and quality improvement tools would be a good approach in the strategy toward meeting ISO standards.

To assess the implementation potential of models for management systems and productivity and quality improvement tools, as well as the effectiveness of the combined application of ISO with productivity and quality improvement tools in Vietnamese businesses, especially for small and medium-sized business, research is needed to select models suitable with the conditions in Vietnam. The article covers the construction of integration models, a survey to assess the condition of small and medium-sized businesses throughout the country; the selection of 30 willing businesses suitable to set up the application of appropriate management systems and productivity and quality improvement tools; and guiding businesses to apply management systems and productivity and quality improvement tools successfully.

2 Research Methods

The methodology of this research is followed by two steps: (i) proposing the models of management systems and productivity and quality improvement tools, and (ii) selecting suitable enterprises to participate according to the pre-determined criteria.

2.1 Models of Management Systems and Productivity and Quality Improvement Tools

Within the scope of the science and technology research, the consulting unit has proposed replication for businesses following three models depending on the characteristics and current state of productivity and quality of the business.

a) Model 1: Select one management system to be applied from the following:

Table 1. Business Selection Criteria for Application

No	Criteria
A	Mandatory criteria (disqualified if any is not satisfied)
1	Business type (Vietnamese business)
2	Business scale (Medium and Small)
3	Want to increase productivity and quality through application of management systems and productivity and quality improvement tools.
4	Commitment to application, and agreement to provide facilities to ensure the application of the management systems and reciprocate implementation expenses
5	Businesses located throughout Vietnam, corresponding to the allocation between three regions, with 15 businesses in the Northern Region, 5 in the Central Region, and 10 in the Southern Region.
B	Optional criteria
6	Yet to participate in other programs assisting the implementation of management systems and productivity and quality tools using state funding
7	Existing management systems and productivity and quality improvement tools
8	Registered before June 2020
9	Agreement to share experiences after participating in the research

- 1) Quality management system ISO 9001:2015;
- 2) Food safety management system ISO 22000:2018;
- 3) Environment management system ISO 14011:2015;
- 4) Occupational health and safety management system ISO 45001:2018;
- 5) Information security management system ISO 45001:2018;

- b) Model 2: Select one basic productivity and quality improvement tool to be applied such as: 5S, Kaizen, 7 Quality Control tools, and KPI
- c) Model 3: Select and apply one management system combined with one basic productivity and quality improvement tool.

2.2 Business Selection Criteria for Application

The Ministry's order for the research is the application of quality control model and productivity and quality improvement tools for 30 businesses (15 in the Northern Region, 5 in the Central Region, and 10 in the Southern Region). To perform the selection of businesses, the research group has surveyed and evaluated businesses using two criteria groups shown in Table 1.

The process for selecting businesses follow these steps:

- a. Communicate about the research and support program
- b. Survey to assess businesses
- c. Select the businesses to participate in the program.

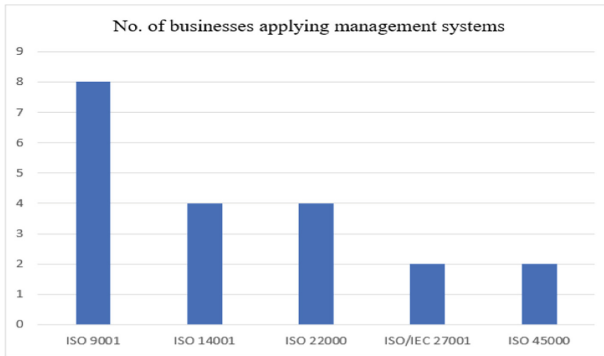


Fig. 1. Number of Businesses Applying Management Systems

Through introduction letters and participation registration forms, the program receives information and registration from 40 businesses. The collected information is assessed against the business selection criteria, and 30 businesses are selected.

3 Result and Discussion

3.1 Description of Participating Businesses

Thirty businesses are selected for the research, including 15 in the Northern Region, in the provinces/cities of Hanoi, Hai Duong, Yen Bai, Ha Nam, Hai Phong, etc.; 5 in the Central Region, in the provinces/cities of Thanh Hoa, Da Nang, Lam Dong, etc. and 10 in the Southern Region, in provinces/cities Ho Chi Minh City, Dong Nai, Dong Thap, etc. This ratio meets 100% of the requirement outlined in the research description.

Going by the distribution requirements for management systems and productivity and quality improvement tools in the research description for selecting supported businesses, the businesses selected are:

- a) 10 businesses setting up management systems.
- b) 10 businesses applying productivity and quality improvement tools.
- c) 10 businesses applying one management system with one productivity and quality improvement tool concurrently.

Figure 1 and Fig. 2 display the number of businesses applying each management system and productivity and quality improvement tool.

3.2 Application Procedure

Following business selection, the team performing the research conducts a survey and builds a consulting document for each business, in which the recommended management systems and productivity and quality improvement tools for the business are declared. After agreeing on the consulting document, the application procedure for each business is carried out as in Fig. 3.

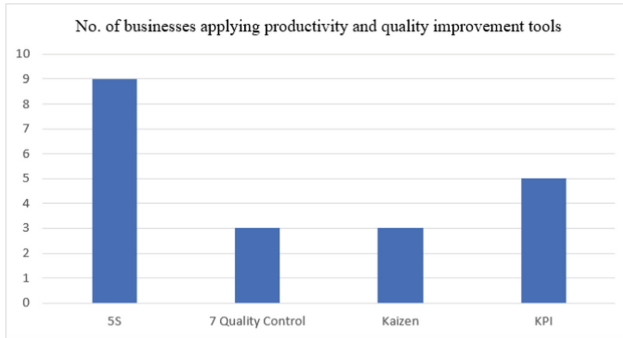


Fig. 2. Number of Businesses Applying Productivity and Quality Improvement Tools

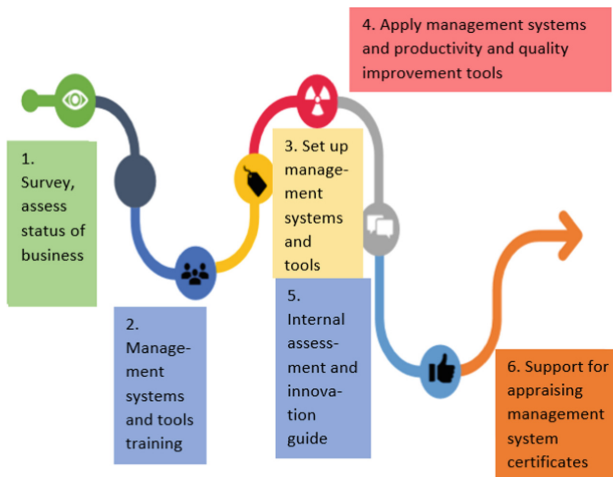


Fig. 3. The Steps in Applying Management Systems Combined With Productivity and Quality Improvement Tools

When performing the integrative application of quality management systems with productivity and quality improvement tools, the guides, forms, and mandatory procedures of management systems are integrated with the procedure for performing productivity and quality improvement. The document hierarchy of the integrated system is shown in Fig. 4.

The procedure is performed for every business, and all 30 businesses pass the appraisal and receive certificate from independent appraisal organisation.

3.3 Outcome and Effectiveness Achieved at Researched Businesses

Among the 30 selected businesses, 10 have successfully applied the ISO 9001:2015 quality management system, the ISO 14001:2015 environmental management system, the ISO 45001:2018 occupational safety management system, and the ISO/IEC 27001:2013

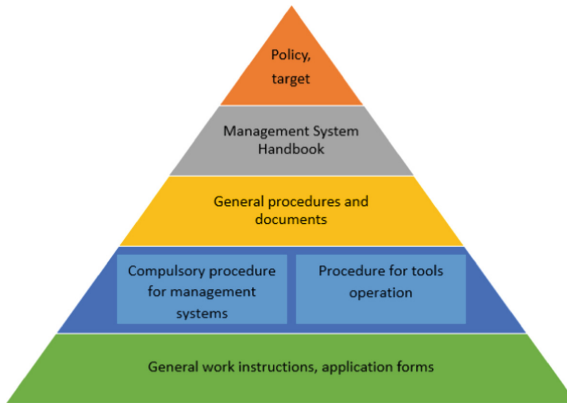


Fig. 4. Document Hierarchy for Management Systems Combined With Productivity and Quality Improvement Tools

information security management system; 10 successfully applied productivity and quality improvement tools 5S, 7 Quality Control tool, Kaizen, KPI; and 10 successfully applied combined management system with productivity and quality improvement tools.

All businesses have been recognised by independent appraisal organisations. The outcomes of application are:

1. All 30 businesses show improvement in discipline, manners, and attitude in work. Improvement rate ranges from 70% to 100% for individual businesses.
2. All 30 businesses gain improvement in awareness of management systems and productivity and quality improvement tools, with most businesses achieving 100% rate of improvement.
3. The rate of new orders resulting from successful application of management systems and receiving ISO certificates also shows a significant increase. Most notable are Medipharco Pharmaceutical JSC, which receives a 62.87% increase in order amount for its new product hand cleansing gel due to receiving ISO certificate, and Ba Duc Trans Co., Ltd, being one of the few transportation companies with ISO 45001:2018 certificates in the Southern Region market, has seen an increase of 42% in the number of customers signing transportation contracts.
4. With the increase in orders, turnover subsequently increases, with Medipharco gaining 58%, Ba Duc 39.7%, TMT 41.62%, Phu Thai 36.8%.
5. Productivity also increases in all 30 businesses, 14 among which record 7.5–25% increase, and 16 record 25–41% increase (Fig. 5).

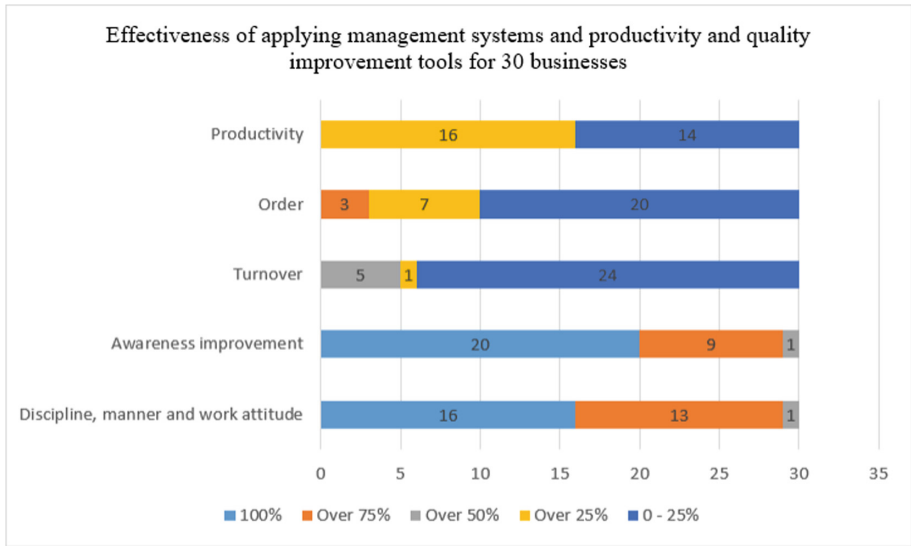


Fig. 5. Effectiveness of Applying Management Systems and Productivity and Quality Improvement Tools for 30 Businesses

4 Conclusion and Recommendation

The promulgation of guidance and replication of the model will create a change in management awareness and methods for the sake of improving operational efficiency and competitiveness of businesses; creating conditions for businesses to make proper investment in the implementation and application of management systems and productivity and quality improvement tools; helping businesses honor their commitments to society so that they can develop sustainably.

The application of management systems demonstrates effectiveness in conserving operating personnel, making business management and administration activities more streamlined and scientific.

Through participation in these improvement projects, employees' awareness and skills, as well as their teamwork ability, their skills for synthesis and analysis of the process, and their initiative for ideas and technical innovations are improved. Businesses appreciate the practical benefits of participating in the support program. Economic benefits can also be measured by minimizing waste in the production process, saving on human resources, time, raw materials, and energy.

Nevertheless, the application of management systems and productivity and quality improvement tools in small and medium-sized businesses faces many difficulties. Due to financial and scale constraints, most small businesses do not have a specialized position in charge of system management or productivity and quality improvement projects, and most of them are only temporary. In many units, the personnel in charge of the system quit their jobs after being properly trained, having knowledge, and mastering the operating methods. In addition, the sense of discipline and self-discipline of a portion of employees is not high, weakening the effectiveness of the system.

References

1. International Organization for Standardization. (2018, September). The ISO Survey of Certification of Management System Standard certifications.
2. Nguyen, V. (2021). Experience in applying management system and improvement tools in small and medium-sized businesses. Doanhnhân Dat Viet. Retrieved from <https://doanhnhan-datviet.com.vn/>

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