Factors affecting the performance of quality management systems

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Abstract: The 4.0 industrial revolution has rapidly changed views on quality and quality management. Therefore, this study is based on the theoretical foundation of quality management to investigate the relationship between factors in quality management, continuous improvement, technology absorption capacity, and performance of quality management system (PQMS) for cosmetics manufacturing businesses in Ho Chi Minh City, Vietnam. The research was conducted using mixed research methods, qualitative research, and quantitative research. Qualitative research was conducted using in-depth interviews with 10 experts. After being supplemented from qualitative research, the official scale with 58 observed variables was used in quantitative research. A quantitative research method with 285 valid samples was carried out to test the scale and theoretical model. Collected data were analyzed using SPSS and AMOS software. This study highlights the role of technology absorptive capacity in cosmetics factories, by finding that the level of continuous improvement of integrated firms along with technology absorptive activities of advanced countries in the world has had a strong impact on PQMS. Findings from this study have shown that inappropriate technology absorption practices can negatively impact PQMS. In the short term, technology absorption activities by manufacturing plants can positively impact the performance of the quality management system, but it is unlikely to last without the assurance of continuous improvement in the production process.

Keywords: Quality Management Systems, Cosmetics Manufacturing, Performance of QMS.

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INTRODUCTION

Currently, the cosmetics market in Vietnam is considered one of the most dynamic in the region. However, significant growth also comes with challenges. Competition in the cosmetics industry is increasingly high, requiring Vietnamese cosmetics manufacturing businesses to focus on product quality and technological innovation to maintain their position. Therefore, manufacturing enterprises must quickly complete the implementation of the quality management system (QMS) according to the regulatory requirements of the Ministry of Health of Vietnam. Quality management is an extremely important factor in cosmetic production to ensure products meet quality and health safety requirements for consumers. Quality management system (QMS) is an indispensable tool for manufacturing businesses in the cosmetics industry in Vietnam. Ensuring product quality helps increase the ability to export products to international markets. International markets require products to meet high quality and safety standards. Quality management is the combination of achieving and maintaining quality excellence in a process of continuous improvement, aimed at eliminating defects to meet customer expectations. However, due to different environments and circumstances, businesses tend to develop different quality management systems and quality practices in their business strategies to compete effectively in the market. The article studies the performance of the quality management system (PQMS) of cosmetics manufacturing enterprises in Ho Chi Minh City, Vietnam, and revolves around some very basic concepts related to the framework of enterprise along with the processes, systems, methods, and resources necessary to maintain the organization's quality management system and improve the effectiveness of the QMS.

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THEORETICAL BASIS

Quality

ISO 9000:2015, a quality-oriented organization promotes a culture that leads to behaviors, attitudes, activities, and processes that deliver value through meeting the needs and expectations. of customers and other relevant interested parties. The quality of an organization's products and services is determined by its ability to satisfy customers and its intended and unwanted effects on relevant interested parties. The quality of products and services includes not only their intended functions and uses but also their perceived value and benefits to the customer.

Quality management system (QMS)

According to the standard TCVN ISO 9000:2015, a quality management system includes the activities by which an organization identifies its objectives and determines the processes and resources necessary to achieve the desired results. A quality management system manages the interactive processes and resources required to deliver value and achieve results for relevant interested parties. A quality management system helps top management optimize the use of resources, taking into account the long-term and short-term consequences of their decisions. A quality management system provides a way to identify actions to address the intended and unintended consequences of providing products and services. In essence, a QMS can be referred to as an integrated set of activities and procedures that stipulate how the elements of a business will contribute to the overall achievement of quality control. A business's quality management system includes written documents that describe the business's procedures and processes at the strategic, tactical, and operational levels (Narayanan, 2010).

Performance of quality management system (PQMS)

TCVN ISO 9000:2015 standard, performance is the relationship between results achieved and resources used. Thus, the performance of a QMS is the relationship between the results achieved by operating the system and the necessary resources used to operate the system. The results achieved by QMS are demonstrated through the level of achievement of quality goals established at all levels and each functional department of the organization in the short or long term. The necessary resources used to operate a QMS include human resources, infrastructure, working environment, finance, etc. The construction and operation of a QMS according to ISO 9000 standards is aimed at satisfying the requirements. Customer requirements with specific, clearly defined quality goals and the orientation that each year's goals are higher than last year's will motivate departments as well as each member of the organization to work hard to achieve their goals, thereby promoting improved work efficiency of each department the organization.

Critical success factors affecting the performance of QMS

Customer Focus (CF)

Customer focus is considered an important QMS practice, because of its potential impact on business performance (Dean & Bowen, 1994; Tan Boon In, 2018). In Nwankwo's (1995) view, considering customers as the focus of an enterprise's product market is the first strategic mechanism to effectively manage customer orientation. The idea of customer focus is considered the starting point that underpins and guides any quality initiative (Sousa, 2003). Maximizing customer satisfaction to meet or exceed customer expectations is a never-ending agenda (Yaacob & Abas, 2011). Customer-focused quality management businesses strive toward continuous improvement (Fryer, Antony, & Douglas, 2007; Terziovski & Power, 2007). Accordingly, customer expectations always change over time (Ortner, 2000). According to Ahire, Golhar, and Waller (1996) customer expectations as a key factor for the production process that a business needs to consider and adjust its operations, to meet their expectations accurately suitable way. In Cai's (2009) research findings, a business's customer orientation is often reported to influence customer relationship practices, which in turn have an impact on production performance, customer satisfaction further contributes to financial performance.

Leadership Commitment (LC)

Top Management Commitment is the first step and a prerequisite for an enterprise's QMS implementation efforts (Zhihai Zang, 2001). Lack of management commitment is one of the reasons for the failure of QMS efforts (Brown et al., 1994). To implement a QMS, top managers should commit to creating a business that continuously considers quality as a primary goal. If the organizational culture does not embody quality, any quality improvement efforts are likely to be shallow and short-lived (Dale, 1999; Juran and Gryna, 1993). According to research by quality experts (Deming, 1986; Juran, 1986) and previous studies reviewed, top management commitment is an important factor in QMS implementation. At the same time, leadership commitment helps improve performance by influencing other QMS practices (Ahire and O'Shaughnessy, 1998; Anderson et al., 1995; Flynn et al., 1995; Wilson and Collier, 2000). Management provides the necessary resources to train employees to use new principles and tools and to create a work environment that is conducive to employee participation in the change process (Ahire and O'Shaughnessy, 1998; Anderson et al., 1995; Bell and Burnham, 1989; Burack et al., 1994;

Daft, 1998; Flynn et al., 1995; Hamlin et al., 1997; Handfield et al., 1998; Ho et al., 1999; Schroeder et al., 1989; Wilson and Collier, 2000).

Employee participation (EP)

Highly effective employee participation at all levels to resolve or investigate cross-functional issues or improvement opportunities involving multiple functions or departments. Sometimes people from external organizations, such as suppliers and customers also participate (Zhihai Zang, 2001). Committed employee participation helps employees contribute more to the success of the business. Employee participation can only be established based on trust between employees and management. Therefore, employee participation can be increased through responsibility (Ikezawa, 1993). More importantly, they need to be treated equally, fairly, and reasonably. Employee participation can be cultivated step by step, it is an incremental process (Bergman and Klefsjö, 1994; Kolarik, 1995). People from all walks of life are important to an organization. Motivate them to fully participate in activities that will utilize their abilities for the organization (Nguyen Quang Thu, Ngo Thi Anh, 2013).

Strategic Planning (SP)

Strategic planning is defined as "A plan of action designed to achieve a long-term or overall goal" in the Oxford Dictionary (Tan Boon In, 2018). Strategic planning generally refers to the practices of how to create and execute strategic action plans of formalized long-term approaches to implementation effectively and effectively can help achieve organizational goals (Wong, Sim, Lam, Loke, & Darmawan, 2010). According to Mintzberg (1994) distinguish between planning and strategic thinking. Strategy in Mintzberg's view cannot be easily conceived as a fixed and formalized process because there are too many uncertainties. Instead, strategic planning stems from strategic thinking where occasional ideas are discovered. In today's ever-challenging environment, strategic planning is considered one of the most important management activities to support an organization towards achieving its goals (Welsh, 2005). The goal of strategic planning is to use and implement action plans (Lee, Rho, & Lee, 2003); Strengthen relationships with suppliers, business partners, and customers (Prybutok, Zhang, & Ryan, 2008); Facilitate long-term and short-term goal achievement through planning (Teh, Yong, Arumugam, & Ooi, 2009).

Process Management (PM)

Process management requires taking a preventative approach to quality improvement, such as designing processes that ensure accurate information is available, and providing stable production schedules and work distribution (Flynn et al., 1995; Saraph et al., 1989) to reduce process variation (Flynn et al., 1995), by building quality into the product during the manufacturing phase (Handfieldt al., 1999). Reducing process variation will lead to increased uniformity of output as well as reduced rework and waste (Anderson et al., 1994; Forza and Flippini, 1998), as quality problems are identified and remedied immediately (Ahire and Dreyfus, 2000). In addition, the empirical findings of Ahire and Dreyfus (2000) and Forza and Flippini (1998) show that process management directly and positively affects product quality. Interest in process management remains high in management research (Hellström, 2006). Process management is the management discipline concerned with behavioral practices, as well as the activities of related process methodologies during the production of products and services (Wong, Sim, Lam, Loke, & Darmawan, 2010).

Management Information Systems (MIS)

According to research by Zhihai Zhang (2001), a company needs an integrated computer information system that collects, stores, analyzes, and disseminates information for specific purposes. There is a lot of data in a company. Only useful information is collected and stored in the information system. Additionally, the information stored in the system must be valid, complete, and accurate (Burrill and Ledolter, 1999; Turban et al., 1999). Such an information system can manage a large amount of information and provide sufficient information for management to make decisions. In addition, different departments can share resources through information networks. Therefore, communication barriers between different departments are reduced.

Creative Culture (CC)

The business environment in today's flat world, in addition to opportunities, always contains risks, uncertainties, and fluctuations. These methods require businesses to always innovate and the creative capacity of businesses plays a key role in completing this task (Hurley and Hult, 1998; O'Cass and Ngo, 2007; Kerlavaj et al., 2010). Therefore, establishing and nurturing a creative culture within a business is essential for competitiveness. Creative culture helps promote the creative capacity of all members of the enterprise (O'Cass and Ngo, 2007; Kerlavaj et al., 2010) and is also a component of organizational culture. The more highly employees rate the creative culture of the business they work for, the more they believe that the business always encourages employees to apply new scientific knowledge to the business, and believe that the business will evaluate high prices for these applications (Kerlavaj et al., 2010).

Continuous Improvement (CI)

According to W. Edward Deming (1986), organizations need to consistently improve production

and service systems to improve quality and productivity, thereby reducing costs. However, today's organizations need to broaden the dimensions of continuous improvement and not just focus on the immediate product and process context, as the management of the organization itself also needs to improve (Dean & Bowen 1994). In addition, there is ample evidence that continuous improvement can have a positive impact on performance (Anderson et al. 1994; Flynn et al. 1995; Li et al. 2003). The goal of continuous improvement is to improve processes to achieve two goals: increasing customer satisfaction and reducing costs (Bagad, 2008).

Technology Absorption Capacity

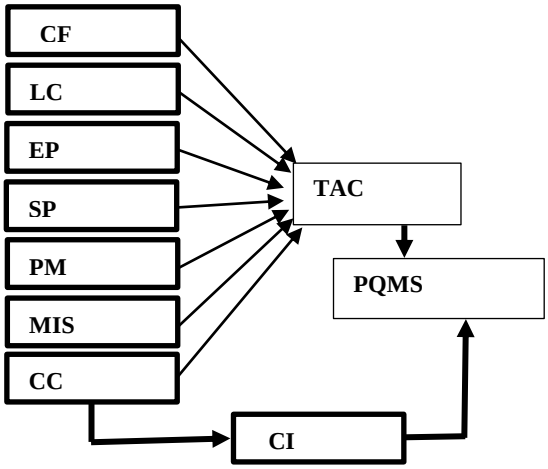
Nicholls-Nixon & Woo (2003) pointed out that businesses in transition economies with high demand for technology can find external sources of technology adoption, and at the same time build technology absorption to create new technical output. Controlling for firm size, the buyer's technology absorptive capacity, and information flow from competitors are positively associated with external technology purchases (Cassiman & Veugelers, 2006). According to Zanello & Associates (2015), in addition to the capacity of the enterprise itself, the institutional context such as socio-economic, political, and legal systems, etc. definitely affects the organization's technology transfer. position. Research by Kimura and colleagues (2015), shows the importance of geographical transfer channels in Southeast Asian countries in accessing new technology. The closer the geographical distance, the higher and more effective the country receiving the transfer and its ability to receive the transfer.

RESEARCH MODELS AND METHODS

Research models

Based on the analysis and inheritance of relevant domestic and foreign research works the proposed research model is shown as follows:

Figure 1. Research model on factors affecting performance of QMS



(Source: Analysis results of the authors)

Research Methods

The authors use mixed research methods including qualitative research and quantitative research, combined with SEM linear structural models and other analytical tools to conduct research. The research subjects are cosmetic and chemical manufacturing enterprises in Ho Chi Minh City. The research period is from December 2022 to December 2023. The number of valid votes included in the analysis is 285 observations. After collected data were cleaned and coded, data was entered and data analyzed using SPSS and AMOS software.

RESEARCH RESULTS

Reliability of the scale and exploratory factor analysis (EFA)

According to Hair, Anderson, Tatham, and Black (1998), Cronbach's Alpha coefficient of 0.6 or higher is acceptable. After performing the Cronbach's Alpha test on the factors, all observed variables have a combined correlation coefficient > 0.3 and the entire Cronbach's alpha coefficient > 0.6. Therefore, the study will not exclude any variables, all of which are eligible to be added to the EFA.

KMO value = 0.909 and Sig. Bartlett's Test value = 0.000 (Table 1), showing that the observed variables are completely suitable for factor analysis with a 95% confidence interval. This result shows that the observed variables in the population are correlated with each other and Exploratory Factor Analysis (EFA) is appropriate. The results of EFA analysis for the scales show that with the factor extraction method, 10 factors were extracted. All the loading factors of the observed variables are > 0.5, so the scale ensures convergence (Table 2).

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.909
Bartlett's Test of Sphericity	Approx. Chi-Square	12949.325
	df	1653
	Sig.	0.000

(Source: Analysis results of the authors)

Table 2. Cronbach's Alpha and EFA results

Observed variables	**Factor**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Performance of QMS (PQMS); Cronbach's Alpha: 0,926										
PQMS8	.873									
PQMS4	.854									
PQMS5	.839									
PQMS7	.799									
PQMS6	.784									
PQMS2	.779									
PQMS3	.728									
PQMS1	.638									
Strategic Planning (SP); Cronbach's Alpha: 0,944										
SP4		.896								
SP3		.875								
SP1		.875								
SP5		.850								
SP2		.835								
SP7		.763								
SP6		.751								
Continuous Improvement (CI); Cronbach's Alpha: 0,918										
CI7			.922							
CI6			.894							
CI5			.878							
CI4			.813							
CI8			.737							
CI3			.645							
CI2			.541							
CI1			.509							
Leadership Commitment (LC); Cronbach's Alpha: 0,936										
LC7				.907						
LC2				.883						
LC4				.825						
LC5				.824						
LC3				.785						
LC6				.770						
LC1				.661						
Technology Absorption Capacity (TAC); Cronbach's Alpha: 0,913										
TAC5					.906					
TAC6					.895					
TAC2					.876					
TAC4					.710					
TAC3					.708					
TAC7					.610					
TAC1					.549					
Employee Participation (EP); Cronbach's Alpha: 0,932										
EP3						.919				
EP4						.865				
EP5						.862				
EP2						.843				

EP1						.770				
Customer Focus (CF); Cronbach's Alpha: 0,937										
CF2							.908			
CF4							.892			
CF3							.883			
CF1							.808			
CF5							.781			
Process Management (PM); Cronbach's Alpha: 0,830										
PM1								.810		
PM2								.729		
PM3								.712		
PM4								.677		
Management Information Systems (MIS); Cronbach's Alpha: 0,823										
MIS3									.801	
MIS1									.712	
MIS2									.695	
MIS4									.672	
Creative Culture (CC); Cronbach's Alpha: 0,698										
CC1										.638
CC2										.609
CC3										.573

(Source: Analysis results of the authors)

Confirmatory Factor Analysis CFA

Convergence test: The results of calculating the extracted variances (AVE) are all greater than 0.5, which means they meet the requirements in CFA confirmatory factor analysis. The combined reliability (CR) of the factors is greater than 0.7, thus satisfying the set conditions. The indexes (MSV) of all factors are smaller than AVE, ensuring the discrimination of the scales (Table 3).

Table 3. Calculation results of CR, AVE, MSV, MaxR(H) indices

	CR	**AVE**	**MSV**	**MaxR(H)**
PQMS	0.927	0.615	0.266	0.934
SP	0.943	0.706	0.255	0.955
CI	0.919	0.591	0.266	0.935
LC	0.937	0.681	0.285	0.941
TAC	0.914	0.606	0.285	0.924
EP	0.934	0.740	0.185	0.940
CF	0.938	0.750	0.156	0.942
PM	0.831	0.554	0.199	0.854
MIS	0.823	0.538	0.226	0.827
CC	0.703	0.517	0.185	0.714

(Source: Analysis results of the authors)

CONCLUSION AND MANAGEMENT IMPLICATIONS

The authors used qualitative and quantitative analysis, combined with SEM linear structural models and other analytical tools to conduct research. The study has systematized some concepts related to QMS and several studies related to the implementation performance of the quality management system. From there, it can be seen that determining the factors that affect the performance of the quality management system in an organization is important for Vietnamese cosmetics manufacturing enterprises in the global economy. Research results show that there are 9 factors affecting the performance of the quality management system (PQMS) including (1) Customer focus (CF); (2) Leadership commitment (LC); (3) Employee participation (EP); (4) Strategic planning (SP); (5) Process management (PM); (6) Management information system (MIS); (7) Creative Culture (CC); (8) Continuous improvement (CI); (9) Technology absorption capacity (TAC). This research result is considered a reliable basis for cosmetics manufacturing businesses in Vietnam to strongly implement QMS nationwide and achieve increasingly effective results. At the same time, the factors identified in this study will support leaders in devising appropriate strategies based on available resources to penetrate international markets and develop sustainably marketed global schools.

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