

Conceptual Framework of Halal Certification Saffron (*Crocus sativus* L.) Products by Using Deming's Theory of Total Quality Management

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Abstract

Purpose: The purpose of this study is to develop a conceptual framework for halal certification by using the Deming Theory (TQM) Approach about producing *Crocus sativus* product with halal certification from JAKIM Malaysia, which can be used as an alternative medicine for cancer patients.

Design/methodology/approach: This quantitative study employs questionnaires as a research tool. It uses the Theory of Quality Management (TQM) underlying the Deming Management Method by Anderson et al. (1995) in this research. Applying regression analysis, this case study will target 100 respondents who are leaders of Saffron (*Crocus sativus* L.) halal herbs firms in Malaysia registered under the National Pharmaceutical Regulatory Agency (NPRA).

Findings: This conceptual paper examines the critical topic of measuring quality *Crocus sativus* L. product with halal certification from JAKIM Malaysia. Through the perspective of Total Quality Management (TQM), underpinned by the Deming Management Method. Applying the original path analytic framework has sought to explain the relationships between visionary leadership, internal and external, learning organization, process management, continuous improvement, employee fulfillment and customer satisfaction of saffron herb with halal certification in Malaysia.

Research limitations/implications: This research offers important implications to researchers, practitioners, and policymakers. The research also highlights the significance of the Theory of Quality Management (TQM) underlying the Deming Management Method by Anderson et al. (1994) in the field of Saffron (*Crocus sativus* L.) product with halal certification from JAKIM Malaysia.

Practical implications: The insights from this research can help manufacturers align more closely with JAKIM's halal certification standards. Understanding quality gaps through

empirical data can streamline compliance processes and ensure that products consistently meet regulatory requirements.

Originality/value: The research develops a valid measure of the Theory of Quality Management (TQM) underlying the Deming Management Method by Anderson et al. (1994) about producing halal Saffron product in Malaysia by using regression analysis.

Keywords: Total Quality Management (TQM), Halal certification, Saffron (*Crocus Sativa*), Herbal Industry

Introduction

The word "halal" comes from an Arabic phrase that is accepted and allowed in Islam. The Department of Islamic Development of Malaysia (JAKIM) has defined halal in two ways: food goods and food-based services and products. Any other term that suggests that food is suitable for consumption or usage by Muslims is halal food. This phrase indicates that the food does not contain any animal parts or materials that are prohibited for Muslims to eat under Sharia law or that have not been killed by the Fatwa and Sharia law. Additionally, food will not include any impurities or *najis* as defined by Sharia and Fatwa laws. The definition of halal also takes into account things that are safe for health (JAKIM, 2014).

Furthermore, Malaysia's halal herbal industry represents a significant segment of the global herbal products market, combining traditional knowledge with modern quality management practices to produce goods that meet stringent halal standards. Ensuring the quality of halal herbal products has become crucial for industry stakeholders as consumers' demand for halal-certified products keeps growing. However, Mokhtar, M. (2016) mentioned in Annual Reports and statistics from 2009 prepared by the Malaysian Adverse Drug Reactions Advisory Committee (MADRAC), stating that the number of adverse drug reactions (ADRs) has increased and is identified as one of the top ten on the list. Recently, Deputy Prime Minister YAB Datuk Seri Dr Ahmad Zahid Hamidi expressed his disappointment with the level of use and development in Malaysia's 14 Halal Industrial Parks across the country; only 11% of the total Halal Industrial Parks have been developed since 2009 (Berita Harian, 2024). However, it has been noted that Malaysians have a greater tendency to use herbal products (Hassali, 2009).

Moreover, Malaysia's pharmaceutical sector has shifted its emphasis to producing herbal goods such as nutraceuticals, dietary supplements, and alternative medicine. According to Defelice, "nutraceuticals" are foods or parts of a food that provide medical or health benefits, including the prevention or treatment of a disease (Brower, 1998). Plant Nutraceuticals have drawn much attention due to their purported safety and numerous nutritional and medicinal benefits (Nwosu & Ubaoji, 2020). Herbal products, recognized in 2011 as a new source of economic growth under the agriculture New Key Economic Areas (NKEA), are closely associated with nutraceutical products. With potential GDP contributions between RM19 billion and RM28 billion by 2027, this industry presents the nation with many exciting options (Malaysia Investment Development Authority, 2020). In addition, the rise in the registration of natural products serves as an example of this, as the National Pharmaceutical Regulatory Agency (NPRA) reports that 12,139 units were natural products or more than 50% of the product listings filed in 2019. Moreover, the attractiveness of the herbal sector as an alternative to traditional medical treatments has grown in tandem with the escalating costs of contemporary healthcare. This could potentially save healthcare expenditures by RM13 billion by 2027, according to the Overview of the National Traditional and Complementary Medicine (T&CM) Blueprint (2018–2027) (Malaysia Investment Development Authority, 2020). Moreover, Grand View Research (2021), the global market for halal cosmetics and personal care products,

which includes herbal goods, is expected to reach USD 93.8 billion by 2028. It was also reported that Asia-Pacific holds the most significant market share. However, despite the growing demand for halal goods worldwide, questions about halal herbal items, such as reliability, security, and effectiveness, continue to exist. There is a call for a thorough analysis of product quality in this expanding industry.

Besides that, a significant percentage of the Malaysian economy is devoted to the halal herbal industry. A combination of Islamic principles with traditional herbal medicines to serve both local and international markets is a must. However, even as it expands, questions remain about how to guarantee product quality, which calls for a thorough investigation to address the challenges and possibilities facing the entire business. Prior research has highlighted that the halal herbal industry has uneven product quality (Abdullah et al., 2020; Sutan, 2019; Mokhtar, M., 2016). Variations in the procurement of ingredients, labelling procedures, and manufacturing techniques all add to consumer mistrust and undermine the credibility of halal herbal goods. In order to improve consumer confidence and the halal herbal industry's credibility, this research intends to go deeper into these quality disparities and how they affect consumer perception. Studies conducted by Ab Rahman et al. (2017) and Razman et al. (2018) have highlighted the difficulties in obtaining halal certification and also meeting regulatory requirements for herbal goods in Malaysia. Small-scale producers frequently need help navigating the certification process, which can result in breaches in regulatory compliance and quality assurance. It is challenging to ensure that herbal industry products can fulfil the requirements for halal certification by JAKIM. The Department of Islamic Development Malaysia (JAKIM) is in charge of halal certification in Malaysia, and it is challenging to achieve standards due to the complexity of herbal product formulations. The variety of raw material sources is also one of the reasons.

In this research, the conceptual paper explores halal product quality measurement within Malaysia's halal herbal industry. The principles of Total Quality Management (TQM) and the Deming Management Method are used for the research. Despite the growing prominence of Malaysia's halal herbal industry, there remains a gap in the literature concerning the systematic measurement of product quality within this context. At the same time, TQM principles are widely recognized as essential for driving quality improvement and organizational excellence. The application within Malaysia's halal herbal industry, remarkably, still needs to be explored. In this research, quality measurement frameworks may need to fully capture the unique attributes and requirements of halal herbal products, subject to quality and halal certification standards by JAKIM. Malaysia's halal herbal industry needs comprehensive research on product quality to tackle the issues arising from halal certification requirements. The industry is vital in meeting the increasing demand for natural medicines and halal-certified products. This study intends to identify gaps in scientific research and emphasize the significance of evidence-based validation in enhancing industry credibility and market competitiveness by reviewing previous literature and empirical studies on halal certification by JAKIM. This study provides practical suggestions to achieve industry halal standards by JAKIM, build consumer confidence, and promote sustainable growth in the halal herbal market through empirical research and stakeholder interaction.

Literature Review

Halal herbal market

Money Compass reported that in 2020, Malaysia had much promise in the herbal industry. Plants, especially herbs, may be processed to create various products, such as food and beverages, lotions and soaps. Demand for halal products has increased because of halal-certified products and the growing demand for natural and traditional cures. Malaysia's herbal

market has grown significantly in recent years. Furthermore, the halal herbal product preferences of Malaysian consumers are shaped by various variables, including cultural traditions, health consciousness, and religious beliefs. Consumers give halal certification top priority when buying herbal products, especially Muslim people (Abdullah et al., 2018). In this particular case, halal labels that are emphasised as a sign of product distinctiveness in businesses that provide sharia-compliant goods fulfil the function of brand equity (Erdawati et al., 2021).

Further evidence suggests that sharia labels indicating a product's halal status can affect consumers' decisions to buy (Asraf et al., 2017). They expressed worries regarding sourcing ingredients, production methods, and product integrity. Marketing activities through marketing initiatives and educational programs are essential for bringing to Malaysian consumers' attention the advantages of halal herbal products. The market for halal herbal products in Malaysia has tremendous growth potential due to rising customer demand for natural and halal-certified goods. According to Erdawati et al. (2021), the quality of the product and the presence of halal labelling are the primary determinants of customer decisions about herbal goods.

Theory of Quality Management (TQM) Underlying the Deming Management Method

The concept was first presented by Anderson et al. (1994). They dispute that the Deming 14 principles are a theory in and of themselves. Thus, they put out the theory to develop an empirical theory about the Deming Management Method. The theory also aims to explain and characterise the adoption process of the Deming Management Method and its efficacy. The theory comprises seven constructs taken mainly from the literature on the Deming Management Model, which Anderson et al. (1994) analysed for the Delphi research. In 1995, Anderson, Rungtusanatham, Schroeder, and Devaraj executed research based on the proposed TQM underlying the Deming Management Method (Anderson et al., 1995). They suggested the following relationship between the seven constructs: The Deming management method's effectiveness stems from leadership efforts to simultaneously create a learning and cooperative organisation to facilitate the implementation of process-management practices. When put into practice, these practices support organisational survival and customer satisfaction through sustained employee fulfilment and ongoing process, product, and service improvement. TQM is a concept with multiple facets that is a logical progression of Total Quality Control (TQC), and it has been characterised in a variety of ways (Alghamdi, 2018). According to Sadikoglu and Olcay (2014), Total Quality Management (TQM) is a management philosophy that is applied throughout the entire company to continuously increase the quality of processes, goods, and services by emphasising customer needs and satisfaction.

Figure 1 shows *the original path analysis of a TQM that underlies the Deming Management Method. The Theory of Quality Management (TQM)*. Furthermore, it is a comprehensive organisational excellence approach emphasising continuous improvement, customer focus, and employee involvement. This literature review explores each factor in the Deming Management Method and its alignment with TQM principles. Below are the details of the discussion on each factor;

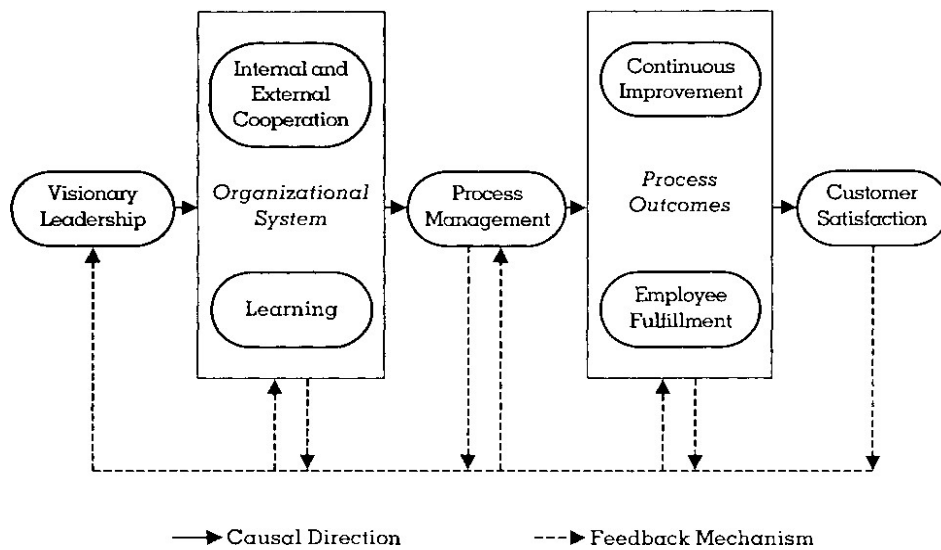


Figure 1: The Original Path Analysis of a TQM Underlying the Deming Management Method

Visionary Leadership

Anderson et al. (1995) state that visionary leadership is a cornerstone of the Theory of Quality Management (TQM), which underlies the Deming Management Method. Leadership style in Deming's Theory emphasises the importance of setting a compelling vision, inspiring organisational change, and fostering a culture of continuous improvement. In Malaysia's halal herbal industry context, visionary leadership plays a crucial role in driving efforts to measure and enhance product quality. Al-Tarawneh and Masa'deh (2019) mentioned the significance of visionary leadership in quality management practices, highlighting its positive impact on organisational performance and innovation. Sarros et al. (2008) suggest that visionary leadership is positively associated with organisational achievement and quality output. Using management techniques like directing, planning, and organising, a leader awakens the power of motivation in their subordinates to help them achieve their goals, vision, and mission (Amer et al., 2019).

Through sharing the future vision with the team in the organisation, executives can mobilise staff members towards shared goals, promoting innovation and progress throughout the organisation. A clear vision for quality excellence may be articulated by visionary leaders in the Malaysian halal herbal industry, who will focus organisational efforts on achieving consumer satisfaction, adhering to halal certification standards, and promoting continuous development. Leaders may foster a culture of quality consciousness, employee involvement, and information sharing in the context of the halal herbal business. These elements are critical for assessing and enhancing product quality. Besides, visionary leaders may encourage staff members to adopt quality management principles and get involved in quality improvement activities by fostering a shared vision of quality excellence. To sum up, the Deming Management Method's Theory of Quality Management (TQM) places great importance on visionary leadership, and this is directly related to the study conducted on Measuring the Product Quality of Malaysia's halal herbal industry. Visionary leaders can spearhead initiatives to increase product quality and raise competitiveness in the halal herbal industry by strategic direction, developing a quality culture, and acquiring TQM concepts.

Internal and External Cooperation

This construct refers to *the organisation's propensity to engage in non-competitive activities internally among employees and externally concerning suppliers* (Anderson et al., 1995). Internal and external cooperation, as highlighted in the Theory of Quality Management (TQM) underlying the Deming Management Method by Anderson et al. (1995). It plays a crucial role in driving quality improvement and organisational excellence. This factor emphasises the importance of collaboration within and across organisational boundaries to achieve common quality goals. Research by Antony et al. (2016) demonstrates that internal cooperation is undoubtedly associated with TQM implementation success, leading to advanced organisational performance and quality outcomes. Internal collaboration between the production, quality assurance, and research and development teams is very crucial for the Malaysian halal herbal industry to maintain consistency in its products, comply with halal certification standards, and pursue continuous improvement.

Furthermore, a previous study on halal supply management places a strong emphasis on the use of halal components throughout the whole supply chain. Halal products place equal emphasis on adhering to Islamic law and ensuring the purity and safety of their products. As a result, all rules and regulations relevant to halal products should be followed, from the production of raw materials to the distribution networks. Accordingly, the halal product supply chain begins from the beginning and continues until the items are delivered to the final consumer (Manzouri et al., 2013; Ibrahim et al., 2023). In order to improve supply chain efficiency, guarantee regulatory compliance, and promote industry best practices, external cooperation enhances working with external stakeholders such as suppliers, regulatory bodies, and industry associations. Working with governmental organisations, business partners, and halal certification authorities can promote information sharing, capacity building, and knowledge sharing, leading to higher-quality products and more competitive markets. Internal and external cooperation are integral components of the Theory of Quality Management (TQM) underlying the Deming Management Method, which is directly relevant to measuring product quality in the Malaysian halal herbal industry.

Learning Organization

A Learning Organization is an *organisational capability to recognise and nurture the development of its skills, abilities, and knowledge base* (Anderson et al., 1995). In order to promote innovation and quality improvement, the factor highlights the significance of knowledge exchange, organisational development, and ongoing learning. To measure and improve product quality in Malaysia's halal herbal industry, it is imperative to cultivate a learning organisational culture. In Malaysia's Halal Herbal Industry, systematic improvement and innovation are driven by a learning organisation approach to measuring product quality. In Malaysia's halal herbal industry, systematic improvement and innovation are driven by a learning organisation approach to measuring product quality. According to research by Sarros et al. (2008), learning organisations are more capable of recognising and handling quality problems, streamlining procedures, and seizing new opportunities. Establishing a culture that values education, experimentation, and information exchange can help organisations become more adept at measuring and refining product quality. Moreover, by continuously learning from internal and external sources, organisations can adapt to changing market demands, improve production processes, and ensure compliance with halal certification standards. By fostering a culture of continuous learning, knowledge sharing, and innovation, organisations can enhance their ability to meet regulatory requirements, satisfy customer expectations, and sustain competitive advantage in the halal herbal market.

Process Management

This construct can be defined as *the methodological and behavioural practices stressing the management of the process or means of action rather than results* (Anderson et al., 1995). It emphasises the systematic approach to analysing, designing, and optimising processes to enhance efficiency, consistency, and quality. In Malaysia's halal herbal industry context, process management is critical to ensure the quality and integrity of herbal products while holding to halal certification standards. In Malaysia's Halal Herbal Industry, process management involves developing and implementing standardised procedures for sourcing, manufacturing, packaging, and labelling herbal products. Research by Suhaimi et al. (2020) highlights the importance of process management in addressing challenges related to halal certification, ingredient sourcing, and product labelling. By adopting a systematic approach to process management, organisations can ensure compliance with halal standards, minimise contamination risks, and maintain product quality consistency. By implementing systematic process management practices, organisations can ensure compliance with halal certification standards. Organisations can also minimise quality risks and enhance product quality consistency, strengthening their competitiveness in the halal industry. Besides, according to Psomas, Vouzas, and Kafetzopoulos (2014), process management's relevance in assuring continuous improvement and high-quality outcomes in the food industry is likely to impact food safety. Also, according to Ibrahim et al. (2023), a previous study has emphasised the importance of process management in providing Halal-Toyyiban food and goods.

Continuous Improvement

Continuous improvement is *the organisation's propensity to pursue incremental and innovative improvements of its processes, products, and services* (Anderson et al., 1995). This variable is one of the backbones of success in quality management practice and positively impacts performance (Caffyn, 1999). Furthermore, Al-Najjar and Abdul Rahim (2023) define Continuous Quality Improvement as a systematic and formal strategy to improve all aspects of an organisation, including processes, tools, products, and services, to evaluate and improve performance.

However, the most crucial point is that these improvements should be frequent, consistent, and continuous, whether they are big or small. It emphasises the ongoing effort to enhance processes, products, and services through incremental and systematic changes. In Malaysia's halal herbal industry context, continuous improvement is essential for measuring and enhancing product quality while ensuring compliance with halal certification standards. Continuous improvement is one of the variables directly relevant to measuring product quality in Malaysia's halal herbal industry. Antony et al. (2016) state that companies with continuous improvement techniques have better marketing feedback (customer satisfaction) and quality performance. Furthermore, according to Ibrahim et al. (2023), all associations, regardless of their sizes, shapes, or tendencies, are today being drilled on continuous improvement (CI), one of the fundamental principles of total quality management (TQM).

Through implementing TQM activities such as quality control methods, frequent audits, stakeholder feedback and customer input, organisations can quickly identify areas for improvement, immediately resolve quality issues, and improve the quality of their goods. Besides that, continuous improvement is a fundamental aspect of the Theory of Quality Management (TQM) underlying the Deming Management Method, which is directly relevant to measuring product quality in Malaysia's halal herbal industry. By continuing continuous improvement practices, organisations can enhance product quality, meet regulatory

requirements, and maintain competitiveness in the halal herbal market, ultimately contributing to long-term success and sustainability.

Employee Fulfilment

This variable refers to *how employees feel the organisation continually satisfies their needs. It derives from employees' pride in quality, satisfaction, and commitment* (Anderson et al., 1995). It also refers to employee satisfaction, engagement, and empowerment within an organisation. This factor acknowledges that satisfied and motivated workers are more likely to make beneficial contributions to initiatives aimed at improving quality, which will ultimately improve product quality results. Ensuring employee fulfilment is essential for assessing and enhancing product quality in Malaysia's halal herbal industry while upholding halal certification requirements. In Malaysia's Halal Herbal Industry, product quality assessment is closely tied to employee achievement. According to research by Antony et al. (2016), motivated and fulfilled workers are more likely to produce high-quality goods and services and positively impact efforts to improve quality.

Organisations should go above and beyond to ensure that their workforce is happy by implementing policies to meet both financial and non-financial goals and foster a healthy work environment. Moreover, in today's cutthroat marketplaces, the ability to hire and keep talented workers with the necessary abilities is essential to success. Furthermore, workers are today seen as an organisation's most valuable asset, as, when used properly, they are in charge of attaining organisational goals (Al-Najjar & Abdul Rahim, 2023). Moreover, organisations can empower staff members to take charge of quality management procedures, spot operational areas for improvement, and help improve product quality by investing in employee training, offering chances for skill development, and creating a positive work environment. Besides, a study by Al-Tarawneh and Masa'deh (2019) explores the relationship between employee satisfaction with organisational innovation and performance, highlighting the positive impact of employee fulfilment on organisational effectiveness. Organisations can create a conducive work environment that fosters quality consciousness, innovation, and continuous improvement, ultimately contributing to enhanced product quality outcomes and organisational success by prioritising employee satisfaction, engagement and empowerment.

Product Quality (reflection of Customer Satisfaction)

In the original framework, Product Quality is not a construct of the framework. Instead, it is called Customer Satisfaction, which is *the degree to which an organisation's customers continually perceive that their needs are being met by its products and services* (Anderson et al., 1995). Customer satisfaction could reflect product quality, as defined by Ishikawa (1985), quality and customer satisfaction are the same. Deming also pointed out that product quality is an aspect of satisfying the customer. Furthermore, as noted by Al-Gasawneh et al. (2022), a competitive advantage can be gained by emphasising the importance of customer focus due to its efficacious function in bolstering brand image, loyalty, and reputation. This can lead to higher sales and profit margins in comparison with competitors.

This factor emphasises meeting or exceeding customer expectations by delivering high-quality products and services. In Malaysia's halal herbal industry context, measuring and ensuring product quality is essential for fulfilling the demand of consumers and maintaining market demand. Furthermore, maintaining product quality is essential to maintain consumer confidence, boost brand recognition, and expand market demand. Gunawan (2022) concluded that customer focus has a strong relationship with overall quality results. In Malaysia's halal herbal industry, a product's quality calls for evaluating its safety, effectiveness, dependability, and adherence to halal certification requirements, among other factors. Besides that, research

by Mohd Yasin et al. (2019) explores the relationship between product quality and consumer perception in the halal products market. They are highlighting the importance of meeting halal requirements to enhance consumer trust and satisfaction. Organisations can measure and improve product quality to meet or exceed customer expectations by employing quality management practices and monitoring key performance indicators. By prioritising quality management practices, adhering to halal certification standards, and meeting consumer expectations, organisations can improve product quality, build brand reputation, and drive market success.

Theoretical Framework

Based on the above relationship of the respective independent variable and the quality performance, the theoretical framework illustrated in Figure 2 of the study is as below:

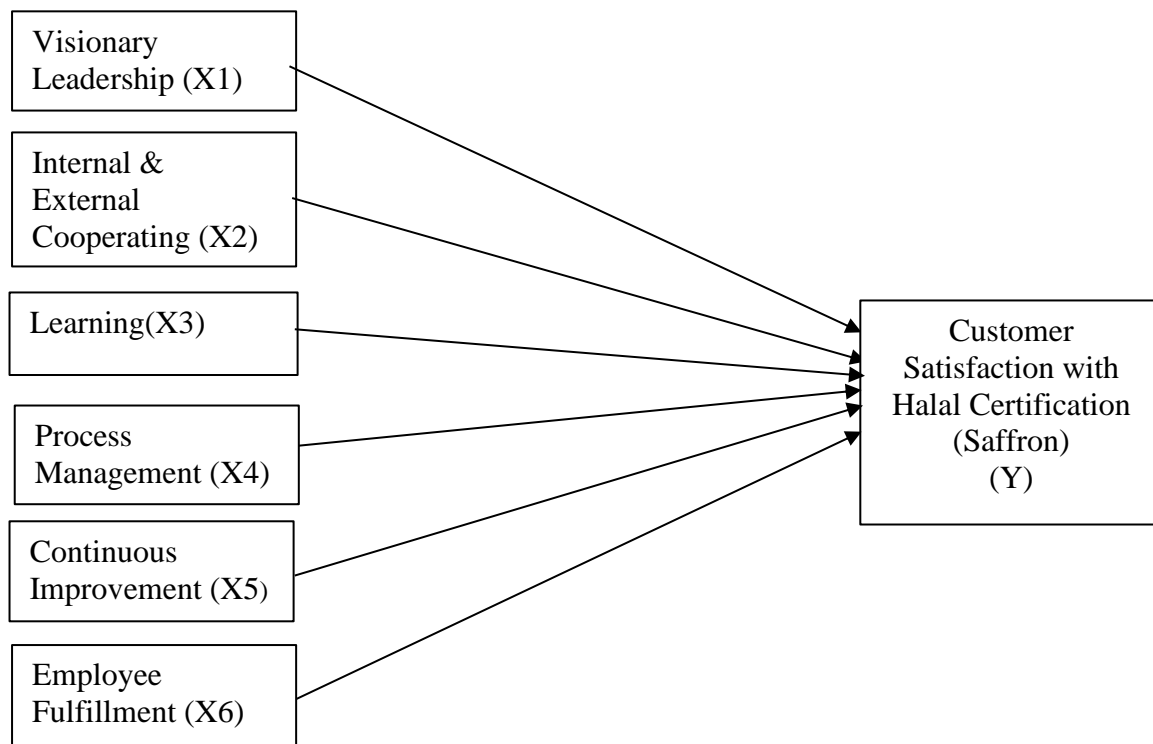


Figure 2: Conceptual Framework Halal Certification (Saffron) using Deming Theory (TQM) Underlying the Deming Management Method

Hypotheses

Based on the research framework, the hypotheses development is as follows:

- H1: There is a positive significant relationship between Visionary Leadership(X1) and Halal Certification (Y)*
- H2: There is a significant positive relationship between Internal & External Cooperation (X2) and Halal Certification (Y)*
- H3: There is a significant positive relationship between Learning (X3) and Halal Certification (Y)*
- H4: There is a significant positive relationship between Process Management (X4) and Halal Certification (Y)*

- H5: There is a positive and significant relationship between Continuous Improvement (X5) and Halal Certification (Y)*
- H6: There is a positive and significant relationship between Employee Fulfillment (X6) and Halal Certification (Y)*

Method

This research aims to measure the relationship between the application of Quality Management System (QMS) concepts in obtaining halal certification and sustaining market presence. The study uses Saffron (*Crocus sativus* L.), a product with halal status, as a case study. The study focuses on the halal herbal industry in Malaysia and utilizes the Theory of Quality Management (TQM) underlying the Deming Management Method by Anderson et al. (1995).

Research Design

This is a quantitative study that employs a structured questionnaire as the research tool. The questionnaire is designed to elicit responses based on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The questionnaire is divided into six sections, each targeting specific constructs of the TQM framework and product quality. The items are adopted from Anderson et al. (1995), ensuring their relevance and validity. Table 1 shows details of the questionnaire design.

Table 1: Questionnaire design

Sections	Details	Sources
Section 1 Profiles and Demographics	This section gathers demographic information about the respondents, such as age, gender, education, and job role.	
Section 2 Visionary Leadership	It contains eight questions aimed at assessing the leadership vision and its implementation within the organization.	Anderson et al. (1995)
Section 3 Organizational Systems	Divided into two parts: Part A: Internal and External Cooperation Comprises three questions focusing on the level of cooperation within the organization and with external partners. Part B: Learning Organizations It includes six questions that evaluate the organization's commitment to learning and development.	Anderson et al. (1995)
Section 4 Process Management	It contains eight questions that address the efficiency and effectiveness of the organization's process management practices.	Anderson et al. (1995)
Section 5 Process Outcomes	Divided into two parts: Part A: Employee Fulfillment It comprises four questions that evaluate the extent to which employees feel fulfilled and valued. Part B: Continuous Improvement Includes four questions focusing on the organization's continuous improvement efforts.	Anderson et al. (1995)
Section 6 Product Quality	It contains three questions that assess the quality of products and the resultant customer satisfaction.	Anderson et al. (1995)

Sampling Strategy

The study targets 100 respondents, specifically leaders of halal herbs (Saffron) firms in Malaysia registered under the National Pharmaceutical Regulatory Agency (NPRA). A purposeful sampling strategy is employed to select informants based on specific attributes relevant to the study. This non-probability sampling method ensures that participants have the necessary experience and knowledge to provide valuable insights into the QMS constructs and product quality.

Data Collection and Data Analysis

The structured questionnaire will be distributed to the selected respondents through online surveys. This mode of distribution is chosen for its efficiency in reaching a large number of participants and facilitating timely data collection. Collected data will undergo rigorous analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) and will be analysed using Smart PLS software. This advanced statistical technique will help assess the measurement and structural model, evaluate the relationships between constructs, and test the hypotheses. PLS-SEM is particularly suitable for exploratory research and theory building in complex models.

Conclusion

In summary, this conceptual paper has to explore the importance of using Total Quality Management (TQM) with six (6) Independent Variables (IV) and One (1) dependent variable, as shown in Figure 2, based on the Deming Management Method, to measure the quality of Malaysia's halal herbal industry. Researchers in Malaysia's halal herbal industry have attempted to clarify the complex relationships between different quality management principles, organizational practices, and product outcomes using the original path analytic methodology. Through extensive exploration and data analysis, this study will highlight the critical role of TQM principles, including customer focus, continuous improvement, employee involvement, and data-driven decision-making, in driving quality enhancement and organizational excellence. By integrating these concepts and the theory of TQM, Malaysia's halal herbal industry can significantly improve its competitiveness, ensure compliance with legal obligations, and meet customer expectations, all while obtaining and maintaining halal standards as certified by JAKIM. The need to study the implementation of Quality Management System (QMS) principles in securing halal certification and achieving market longevity for *Crocus sativus* L. (saffron) in Malaysia is multifaceted. Firstly, QMS principles ensure that saffron products adhere to high standards of quality and safety, which is paramount in the herbal market where efficacy and safety are crucial. Halal certification, backed by rigorous QMS practices, builds consumer trust and loyalty, thereby enhancing market competitiveness and ensuring sustained demand.

Furthermore, the halal certification process, supported by QMS, opens up significant market opportunities both domestically and internationally. With the global market for halal products expanding, Malaysian saffron producers can leverage halal certification to access new markets and increase their market share. Compliance with JAKIM's stringent certification requirements not only meets consumer expectations but also aligns with international standards, fostering greater market acceptance and credibility. In addition, this conceptual framework has also clarified how TQM constructs interrelate and impact product quality performance with halal certification by JAKIM. This framework offers a theoretical basis for empirical studies and

real-world implementations, enabling organizations to create a collaborative environment, foster a culture of quality awareness, and achieve sustainable growth in Malaysia's halal herbal industry. Implementing a comprehensive approach to quality management can lead to continuous improvement, innovation, and excellence, setting a benchmark for the industry. Thus, this conceptual paper serves as a starting point for further research and discussion on measuring and enhancing product quality in Malaysia's halal herbal industry. By combining the principles of TQM and the Deming Management Method, stakeholders can pave the way for ongoing improvement and innovation, thereby driving excellence in this vital sector. The insights gained from this study are expected to help industry players meet regulatory and consumer demands, establish a strong foundation for long-term success, and contribute positively to public health and economic growth.

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