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Critical Success Factors and Tools for Working the Total Quality Management Revolutions in Management Practice: A Review

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Abstract

Objective: The objective of this review is to spotlight, based on contextual fit, the essence of the Total Quality Management (TQM) concept, advance the context-specific tools for its adoption, and suggest Critical Success Factors (CSFs) researchers and management practitioners should consider when considering any TQM initiative. **Method/Analysis**: The traditional narrative review design was used. Based on the authors' extensive readings, a number of TQM tools and CSFs reflective of Lee's conception of the paradigmatic shifts in management practice were identified from the extant literature. A synthesis of a selected set of TQM tools and CSFs form the paper's argument. **Findings**: The results show that when conceptualised to reflect the appropriate management context (mechanical, biological, or social), TQM can impact organisational outcomes based on intervention in six areas. Five management tools and a set of three foundational CSFs form the operational grid for a typical TQM programme. **Novelty**: Against the backcloth of the five revolutions in management, this paper presents a set of five management tools that could be used across industry groups in implementing TQM programmes based on the pedestal of three foundational CSFs.

Keywords: Ethics, Integrity, Management Revolutions; Total Quality Management, TQM Tools, Trust

1. Introduction

The concept of TQM was developed by an American, W. Edwards Deming¹, after World War I for improving the production quality of goods and services². However, the concept was not taken seriously by Americans until the Japanese, who adopted it in 1950 to resurrect their battered post-war business and industry, used it to dominate world markets by 1980³. Since then, TQM has been applied both in manufacturing and service industries in both market and planned economies of the world, especially in the West and Japan, with varying successes^{4–7}.

TQM seeks to engender continuous improvement in the whole gamut of an organisation's processes, the ultimate end being not just to reduce defects in output but principally to increase the value an organisation creates on a sustained basis^{8,9}. Thus, TQM is a management model that is ultimately customer-centred.

In this review, we utilised the narrative form of literature review in extrapolating a number of TQM tools and CSFs that reflect Lee's 10 triple-stage paradigm shifts [mechanical \rightarrow biological \rightarrow social] in management scholarship and practice. In the narrative design, the researchers typically draw upon their knowledge of the

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topic and experience in discipline11 to support their stance on the topic¹². We followed these criteria. Again, in narrative design, little or no explanations are given as to why and how the reviewed sources were included13. Accordingly, the sources reviewed were eclectically chosen to reflect the stance of the researchers on the relevant issues without attaching any weight to "the actual number of available references"13 on the issues.

2. TQM: Concept Analysis

Following 10, we discuss TQM backwards. We begin with "M"—Management.

2.1 Management

In the last hundred and ninety years or so there have been three major shifts in the management model^{14,15}. The shifts started from the mechanical model to the biological model and to the social model. TQM is the first successful implementation story of the social model of management. The mechanical model depicts an organisation as a machine, and every employee is a part in the machine, like a nut, a bolt, a crankshaft, a cylinder or a tire. People and parts were interchangeable, with the uttermost aim to act in line with the owner's directives 17. Organisations run on the basis of the mechanical model are common in Nigeria, especially in the public sector. The result is that employees keep on doing the same thing year-in-year-out oblivious of changes in the operating environment. Consequently, no any progress is made in terms of improved processes, methods and products. The nation recedes into history while the world surge forward into the exciting future, because a significant portion of Nigerian managers run their offices on the basis of the mechanistic model¹⁸.

The biological model emerges on the heels of the mechanical model as a response to employees need to have a sense of purpose in their workplaces 19,20. In this model, the organisation is an organism, like a person 10,21. The brain is the Chief Executive Officer (CEO), or top management, and everybody else in the organisation make up the rest of the body. The decision of the supposed role of the organisation, coupled with the observation of day to day running of each part, and the submission of feedback to the parts that has unsatisfactory output fall within job specification of the top management in this model. The biological model addresses change in an evolutionary manner. This management model is adequate in stable climes where change is slow and predictable. But Nigeria's operating environment is characterised by unpredictable and sometimes paradigmatic changes, thereby making organisations unable to cope with the changes. Hence, we see institutions, laws, procedures, etc. that have outlived their purposes, zealously adhered to and expected to deliver quality services to the user community. It is like trying to get water from a mirage.

The social model sees an organisation as a microcosm of the larger society, made up of individuals capable of thinking and learning for themselves. Thus, unlike in the biological model where managers (the brains) supervise the work of subordinates, in the social model, the manager's job is not to supervise but to manage the interactions among subordinates²². This is because today, most subordinates can do their jobs better than their managers can¹⁰. A key reality in the social model is that each member of an organisation has a mind of his or her own; the manager's job is to manage the interaction among these minds to continuously develop all processes in the organisation. Continuous improvement is the hallmark of the TQM model.

2.2 Quality

The definition of this term evolves alongside the shifts in management model¹⁰. Earlier, in the 1950s, quality is defined as fitness-to-standard. That is, you produce a product to meet a standard set by management. This is the definition in the era of production-orientation, where goods and services are produced independent of market signals. The attempt to produce based on market (customer) needs shift the definition of quality to mean fitness-to-use. Again, the rising cost of input resources in the 1970's, especially energy, added fitness-to-cost in the definition of quality. This means organisations must produce not only according to customer (market) needs but also at lowest cost. Finally, the emergence of globalisation and its catalytic forces of liberalisation and competition require organisations to develop competitive advantages in their offerings. This development led to the definition of quality in terms of fitness-to-latent requirement.

The implication of the foregoing discourse on quality is that the evolution of the definition of quality will continue10, in the spirit of TQM's continuous improvement principle.

2.3 Total

The word "Total" takes on shifting connotations coterminous with the evolution of "quality" mentioned earlier. In the "fitness-to-standard" quality stage, "Total" means ensuring quality from purchasing to shipping; in the "fitness-to-use," it calls for the integration of all firm functions-finance, production, marketing, administration, purchasing etc.—against a common denominator: market (customer) demands. Thus, the definition of "Total" changes with the definition of "Quality". However, a combined reading of ²³ and ²⁴ suggests that "Total" in TQM requires meeting the expectations of an organisation's internal and external, present and future stakeholders including shareholders, bondholders, employees, customers, suppliers, consultants, bankers, creditors, debtors, wholesalers, retailers, the government, the public, and the concerns, rights and interests of future generations.

If we are to define TQM, the points raised in the foregoing discourse on "Total," "Quality" and "Management" have to be integrated into a coherent whole. Accordingly, TQM is defined as a "management paradigm based on the principles of total customer satisfaction, employee involvement, continuous improvement, and long-term partner-ships with suppliers and customers"25 and interests, concerns and rights of future generations²⁴. It is a tool by which management and employees can become involved in the continuous improvement of the production of products. It is a combination of quality and management tools aimed at increasing value to customers and reducing wasteful practices8.9.

The applicability of TQM cuts across private and public sector organisations. It has been known to improve performance in regional trade²⁶, service firms²⁷⁻²⁹, the academia^{5,30,31}, as well as in government^{7,32}, non-governmental organisations³³, and in business^{10,4,34}.

3. The TQM Revolutions

The paradigmatic shift TQM brought about in management practice can be seen as "revolutions" 3.9.35,36. These "revolutions" can be seen in at least six areas: quality in everything, continuous improvement, the right thing right culture, customer focus, total participation, and quality leadership and motivation.

3.1 Quality in Everything

According to 37, any organisation that aspires to be a TQM organisation must strive to achieve quality in everything it has or does—its people, processes and products. Achieving quality in people calls for quality in recruitment and selection, quality in orientation, quality in appraisals, quality in promotion and rewards and quality in human resource development and management^{38,39}. Attaining quality in process means all organisational processes of administration, information, finance, marketing, production, audit, reception, strategic planning, telephoning, sales, etc. must be capable of delivering to the customer the right product and services right first time every time at the lowest overall cost^{7.40}. Finally, a quality product is that which fully meets the customers' needs and expectations, as earlier stated in our definition of quality^{30,41}.

3.2 The Right Thing Right Culture

When TQM has become the culture of an organisation, says_37, the employees in that organisation are turned to striving to doing only the right things, and doing them right first every time. The right things are judged strictly from the lenses of the customer²⁹. This is because customers have impressions of quality, their impressions and goals influence their choices, and their choices determine the fate of organisations⁴²⁻⁴⁴. Thus, in a TQM organisation, only activities that have customers and help to satisfy the requirements of their customers are considered acceptable. Any activity or product that has no customer (internal or external) is considered unnecessary and discontinued. This practice, where institutionalised, would obviate the expending of energy and scarce resources on useless activities or products that cannot move the organisation forward.

The maxim is: Do the right thing right first time every time. When this maxim becomes the expressive culture for doing any work, a win-win situation emerges. It is a winning case for the customer who perceives the organisation as one that always delivers the right product right first time; it is equally a winning case for the organisation that is constantly finding innovative methods for improving its process while delighting the customer for improving its process while delighting the customer productivity and profitability.

3.3 Continuous Improvement

Continuous improvement entails finding better alternatives of carrying out a function, not minding whether the existing methods are satisfactory³². This approach is necessary for survival in today's rapidly changing and highly competitive world. In operationalising the continuous improvement principle, organisation should use the scientific method to find out what management methods really work in a given situation^{47–50}.

The scientific method includes several key principles. One is that organisation must utilise both theory and practice; neither alone is sufficient; Another is that there is no final answer to any problem; each answer builds on both prior and new understanding⁴⁹. Finally, the scientific method requires tangible processes and testable hypotheses. The continuous-improvement approach subsumes the ideas of statistical process control, reactive improvement of products and processes, and practice improvement of new products and processes⁵⁰.

3.4 Customer Focus

In traditional organisations, customers are not usually consulted for their opinions; the management presumes to know better than the customer what the customer wants. The TQM organisation, on the other hand, considers customers as partners and makes decisions based on customer expectations; it keeps its eyes on the customer in order to respond fast enough to new customer needs and to make sure that scarce resources are deployed as effectively as possible to provide customer satisfaction^{17,51}.

In29 identified three essential elements for customercentred organisations. One is developing a true passion, a genuine enthusiasm, for customers. Customer satisfaction must be seen as urgent and personal, not long-term and abstract. The place of leadership in instilling this spirit in the organisation is paramount; customer-focused organisations are noted for their style of leadership, a type of leadership conveys the importance of paying close attention to the customer through personal values and examples. The second essential element is organising around the customer. This includes fundamental organisational structure that places emphasis on points of contact with the customer, commitment to problem resolution timely, real time where possible, robust performance measurement, recognition and rewards and communications. Last is deep understanding of customers. This goes beyond market research studies and customer satisfaction surveys.

In TQM organisations, an approach called Customer-Centred Management is enabling decision makers to integrate all sources of customer data, both analytical and anecdotal, to develop long-term customer loyalty⁵². This kind of loyalty creates repeat business and referrals to friends and business associates.

3.5 Total Participation

This method differs from the conventional method in that all participants work hand to hand, and in all manner of works, to achieve the objectives of the organisation. Continuous improvement implies change accepted across the entire organisation⁵³. Continuous improvement of organisation's products and processes depends on integration of insights and skills from people throughout the organisation and from people outside the organisation, such as customers and suppliers^{54–56}. Total participation embraces the ideas of quality circles, teamwork, crossfunctional teams and so forth.

One technique that can be used with effect in fostering total participation is the Participatory Design (PD)⁵⁷. This aims to address organisational issues and create shared understanding and knowledge among the individuals who do the work: process participants⁵⁷. PD actively involves the process participants in the design and man-

agement of the work process. This requires creativity, negotiation, experimentation and collaboration.

3.6 Quality Leadership and Motivation

Leadership and its key function (motivation) are central to the initiation development, and implementation of quality management practices in all organisation types 56,58. Thus, the onus for ensuring the success of any TQM programme lies on the shoulders of the top management team^{59,60}. In other words, executives are expected to create a collaborative/participative atmosphere in the resolution of problems and encourage staff to take initiatives 61,62.

TQM calls for quality leadership at all levels of the organisation that can motivate their followers to peak performance through creating room for innovativeness, and inspiring shared vision^{63,64}. In⁶⁰ and⁶⁵ are emphatic that quality leadership is a sine-qua-non for successful implementation of TQM. In⁶² identified what quality leaders do and how they do it to be successful. These include the following:

- Continuously reflect on themselves
- Act flexibly and creatively with others to get things
- Create a trustworthy, values-driven environment
- Don't lose heart
- Determine, plan and effect key strategic decisions
- Focus the organisation on the right things
- Manage the performance of others to achieve the organisation's objectives

Quality leadership also requires motivating people. Only a highly motivated workforce can produce the behavioural requirements for a successful TQM implementation 66.67. In 68 gave eight requirements for motivating employees:

1. Instil an inspiring purpose. Every manager should be able to expressly state a strongly purpose for his/her unit.

- 2. Provide recognition. This reinforces accomplishments, helping ensure there will be more of them.
- 3. Be an expeditor for your employees. That is facilitate, getting employees jobs done by ensuring they get what they need to succeed.
- 4. Coach your employees for improvement. Provide feedback on performance, good or bad.
- 5. Communicate fully. Constantly ask what your employees want and need to know.
- 6. Face up to poor performance. Deal decisively with the few employees who don't want to work.
- 7. Promote teamwork. Where possible, organise employees into self-managed teams, with teams having authority over matters that make up their
- 8. Listen and involve. Give an open ear to employees' idea s and involve them in pursuing such ideas.

4. Tools for Working the TQM **Revolutions**

Various TQM tools exist that enables managers successfully implement the TQM model, thereby helping in catalysing the drive for management excellence. Five of such tools are discussed and in this paper 50,69.

4.1 Quality Delivery Process (QDP)

QDP requires every work, from the top management committee to the work group at the lowest rung of the organisation's hierarchy^{37,70-72}, to: (i) define their mission in business; (ii) determine their outputs and ensure harmony between outputs and mission; (iii) identify customer(s) for each output; (iv) determine customer requirements for each output; (v) develop specifications for each output that satisfy the customer's requirement; (vi) establish a work process capable of delivering output which satisfies the customer's requirements at the lowest overall cost; (vii) identify performance indicators which measure actual quality level delivered with output specification; and (viii) identify improvement opportunity caused by any shortfall in quality of the output.

4.2 Voice of the Customer (VOC)

As a customer-centred management model, TQM requires critical input from the customer. Voices of the customer, not those of management or employees, are critical in creating and delivering customer-satisfying offerings on sustainable basis⁷³. VOC is methodological tool that assists the TQM organisation define the key areas of satisfaction for its stakeholder groups⁷⁴. The basic methodology of VOC, according to ⁷⁵, includes: determination of key problems; identification of specific customer needs for improvement setting direction for the organisation based on customer needs; and anticipation of future customer's needs. This tool gives the organisation the resilience to be a customer-focused entity^{76,77}.

4.3 Concept Engineering (CE)

Translating voices of the customer into specific customer requirements entails the application of Concept Engineering (CE). CE is a proprietary tool developed by the Centre for Quality of Management at Massachusetts, USA, for discovering the tacit knowledge within an organisation and the marketplace the organisation serves 17.78. It is a set of activities geared toward understanding the customer's latent requirements, leading to the creation of a product concept⁷⁹. The heuristic algorithm used in the application of CE is as follows: Ask open ended questions and observe technology use in the marketplace; develop a picture of potential marketplace needs based on what people are saying and doing; state and organise the potential marketplace needs objectively; test these tentative market needs through market surveys; and develop a variety of product concepts and select from these the best available product solution concept^{80–82}.

4.4 Quality Control Circles (QCC)

A large number of quality problems are more than what an individual employee can address; they require teamwork. QCC is the tool used in addressing such problems. In QCC, all members of a small work team work together to minimise variation in products and services and to improve the quality of products and services⁸³. QCC are based on two principles. First, they embody appropriate process improvement methods, which team members

learn and apply. Second, QCC activities are voluntary—an indication of compatibility with the social model of management discussed earlier in this paper⁸⁴.

4.5 Language Processing Method

This TQM tool facilitates the social model of management, including the operationalisation of QCC⁸⁵. It has three phases. In the first phase, each team member states his or her own views about a situation. In the second phase, each member is asked to clarify his or her views—through explanation and clarification—until each view is clear to the other team members. In the third phase, the participants work together to group similar views and to state what is common about them. Thus, the LPM tools helps people investigating complex situations together bring to bear the insights of all, preventing conclusions from being based on comparative positions in the organisation's power hierarchy.

5. TQM's Critical Success Factors

CSFs represent prerequisites for the adoption and successful implementation of typical TQM initiatives. A number of CSFs exists in the literature, ranging between less than 3 to more than 42^{69,86}. Clearly what is critical is contingent on contextual factors as well as on the study approach adopted. However, a combined reading of ^{87,88} suggests a 3-group schema of CSFs: namely, foundational, strategic, and operational groups. This paper focuses on the foundational group.

The foundational group of CFAs provide the philosophical basis for TQM's CSFs. We zero on three of such CSFs: namely, ethics, integrity, trust, training ^{88–92}. They provide the grid upon which the successful adoption of TQM should be launched, fostering, as it were, openness, fairness and sincerity and allow for involvement by everyone ^{88,93–97}. A successful implementation of TQM management model is contingent on the activation of these CSFs.

5.1 Ethics

Ethics is the discipline concerned with what is good and bad in any situation. It involves, rules of ordinary decency meant to ensure integrity, honesty and fairness in both individual and organisational behaviours⁹⁷. Thus, ethics is a two-faceted subject represented by organisational and individual ethics. Organisational ethics establishes a business code of ethics that outlines guidelines that all employees are to adhere to in the performance of their work. Individual ethics include personal notions of what is right or wrong. Collectively, organisational and individual ethics makes conscientious employees whose decisions not only advance organisational objectives but also harmonise with the present and long-term concerns of the society $\frac{98}{}$.

5.2 Integrity

Highlighting on the place of integrity in fostering teamwork for excellence in service and productivity, 99 aver that integrity entails a state of honesty, uprightness, sense of honour, ability to abide by agreement, and faithfulness. In¹⁰⁰ also states that integrity implies honesty, morals, values, fairness and adherence to the facts and sincerity. People see the opposite of integrity as duplicity. TQM will not work in an atmosphere of double-dealing, deceitfulness, deceiving by thinking one thing and saying another or by wilfully saying different things at different times 101. In¹⁰⁰ sees integrity as one of her six catalytic keys to leadership effectiveness in business and life. Unfortunately, the Nigerian environment is hostile and not conducive for good honest administration and business and life ambitions 102.

5.3 Trust

Trust refers to confidence in an organisation, an individual manager or group of managers because of the qualities customers or employees perceive or seem to perceive in the organisation and or its management 103. Trust is predicated on people's or organisations good qualities; it is therefore a by-product of integrity and ethical conduct. An unethical manager who lacks integrity can never elicit trust from his peers, subordinates or customers. Thus, without trust, the framework of TQM cannot be built 100. The fulcrum of most organisations—especially in banking—is trust; without it, investors would not have the confidence to invest their fortunes in it, employees will

not be committed in their work33. Trust fosters full participation of all stakeholders. It allows empowerment that encourages pride and commitment. It allows decisions making at appropriate levels in the organisation, fosters individual risk-taking for continuous improvement and helps to ensure that measurements focus on improvement of processes and product is, and are not used to sanction people. Trust is essential to ensuring customer satisfaction. So, trust builds the cooperative environment essential for TQM.

6. Conclusion

TQM is a catalytic tool for achieving excellence in the practice of management. Its continuous improvement principle gives it a dynamism by which organisations can anticipate, meet and surpass customer expectations. However, its implementation requires the presence of a culture—of ethical conduct, of integrity and of trust that harmonise with its principles. Sadly, the norms and values pervading the Nigerian environment are diametrically opposed to the basic tenets at the root of TQM. Hence we can conclude that the probability of achieving management excellence through the application of TQM in Nigeria is remote. The prevailing value system does not allow for this achievement¹⁰⁴. The emergence of positive values of hard work, ethical conduct, integrity and honesty and trust and their internalisation will constitute the bedrock for the design and installation of effective TQM structures in Nigerian organisations.

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