Fundamentals of Quality

QUALITY
IMPROVEMENT
INSTITUTE OF NIGERIA

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Fundamentals of Quality

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Contents

Dedicated to all quality people on planet earth!

Preface

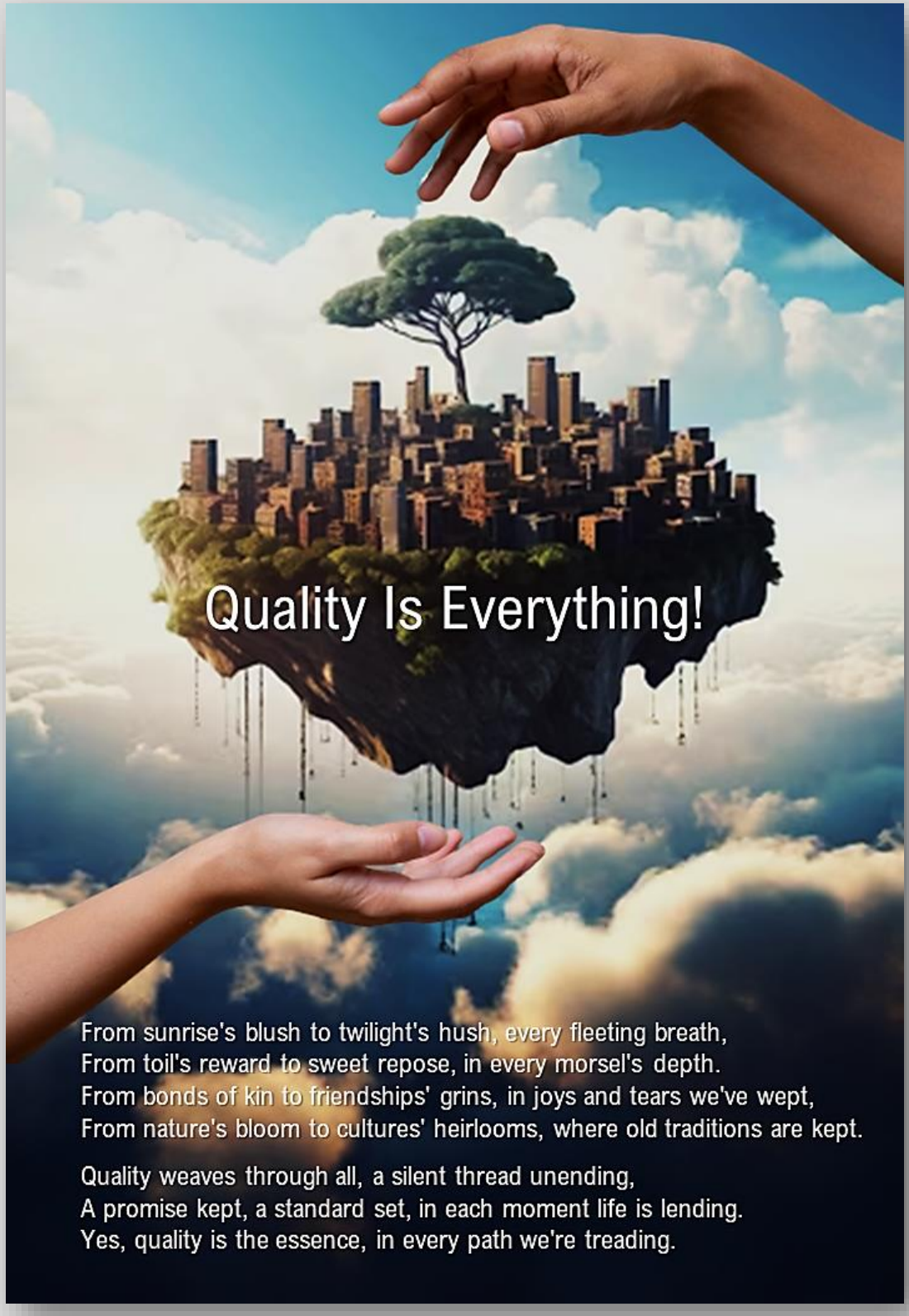
Imagine a world where every individual is conscious of the value of quality in their choices and actions. Think of a society where professionals do not just meet but exceed quality requirements in every facet of their daily lives. Such a world is not just a dream but a mission—our mission. At the Quality Improvement Institute of Nigeria (QIIN), we are committed to making the world a quality place for all by cultivating quality-conscious individuals, professionals and organizations.

"Fundamentals of Quality" is a testament to this mission! We often consider the intrinsic and extrinsic factors that determine the quality of the many things around us in an increasingly complex world. This book answers these questions and explains the many facets of quality.

We aim to bridge the gap between intricate quality theories and their tangible, real-world implications. More so, we envision a society where everyone appreciates, understands, and strives for quality in every endeavor. This book is not just an academic endeavor; it is our legacy to Nigeria and the world.

While our primary focus is the holistic understanding of quality, our exploration moves beyond mere English dictionary definitions without delving too deeply into other related terminologies in quality management. But we traverse the historical perspectives of key thinkers, analyze contemporary interpretations across quality requirements by standards, law, regulations, customers, products, services, and processes, and even peer into the future trends of quality. In line with the principles of the ISO (International Organization for Standardization), we aim to present insights that are both rooted in foundational knowledge and forward-thinking.

As part of our commitment to this mission, we are offering this book, "Fundamentals of Quality" for free to everyone. We believe that knowledge about quality should be accessible to all, and through this gesture, we hope to take one step in Nigeria and the next closer to our vision of a quality-conscious world.


Quality Is Everything!
From sunrise's blush to twilight's hush, every fleeting breath,
From toil's reward to sweet repose, in every morsel's depth.
From bonds of kin to friendships' grins, in joys and tears we've wept,
From nature's bloom to cultures' heirlooms, where old traditions are kept.
Quality weaves through all, a silent thread unending,
A promise kept, a standard set, in each moment life is lending.
Yes, quality is the essence, in every path we're treading.

1 Quality is Everything

1.1 Quality Journey: A Personal Investment

You have chosen to invest not only your quality time but also your intellectual resources into reading about quality in this book. This decision was not made lightly; it also speaks of the quality of your personality, and we believe it is great! You have embarked on this journey, perhaps with the expectation of enriching your comprehension of quality, or out of curiosity about what we assured the quality professional is trending in quality, or because you want to earn the certification afterwards and begin a career in quality management. Irrespective of your reason, we have strived to capture the essence of quality in these pages. Because after all, quality is everything, and we want your journey through this book to be nothing less than a worthwhile personal investment.

Did you notice that the font type in this book is Baskerville, one of the publishing standards, the font size is slightly larger, and the line spacing is wider? These are qualities of thoughtful and inclusive design. Such elements have been meticulously chosen to enhance readability and make the reading process enjoyable for a broad range of readers. Whether you are skimming through the book in a bustling cafe or delving deep into its contents in a quiet corner of your home, these design decisions contribute to the quality of your reading experience. We have taken every measure to ensure this book does not just inform, but also pleases your eye and respects your comfort. After all,

quality is not just about what is written on the page; it is also about how those words are presented.

Just as chemistry is fundamentally "the study of what things are made of—living and non-living things," quality, in its simplest form, is omnipresent—it is everything, everywhere, and at every time. The concept of quality permeates every facet of nature, our existence, silently yet persistently coloring our perceptions, actions, and experiences.

1.2 The Silent Weaver of Our World

Quality determines our satisfaction, our trust, our safety, and even our happiness. It serves as a fundamental thread weaving together various realms, be they business, philosophy, religion, or even the physical and medical sciences. From the production floor of a manufacturing enterprise to the philosophical debates in academic halls, the resonance of quality is audible if we listen closely.

When we speak of quality in business, which commonly seems to be the primary focus, but of course it should not be, we refer to the inherent value that distinguishes superior goods or services. It is a competitive lever that can elevate an organization's offerings above the market's mediocrity. It is not merely a parameter to be achieved, but a continuous quest for excellence.

In philosophy, quality encapsulates the unique attributes or properties that define an entity, guiding our understanding and interaction with the world

around us. It is a lens through which we interpret our environment, influencing our thoughts, decisions, and actions. So also, in religion, quality transcends the mundane to touch the Divine. It symbolizes the spirituality and attributes of the Creator—His omniscience, omnipotence, and supreme goodness. Quality, in this context, guides moral conduct and shapes our spiritual outlook.

In the healthcare sector, quality transcends traditional interpretations to encompass life-saving measures, patient wellness, and optimal health outcomes. Not merely confined to accurate diagnoses and effective treatments, quality in healthcare also involves patient safety, efficient use of resources, and the reduction of medical errors. While in the realm of physics or physical sciences, quality characterizes the responsive behavior of systems, offering insights into their performance under different conditions. It is the bedrock upon which we develop models, draw inferences, and predict phenomena, impacting advancements in technology and society. Whether we consider energy quality, data quality, service quality, or vapor quality, each represents a distinct facet of this multifaceted concept. Each stand as a testament to quality's ubiquitous nature, pervading varied disciplines and domains.

However, quality is not just a theoretical concept to be studied in isolation. It is an operative tool that underpins practices like Quality Assurance (QA), Quality Control (QC), and Quality Management Systems (QMS), which include Quality Improvement (QI). These practices translate the principles of quality into actionable strategies, driving organizational excellence and societal progress.

It is this essence of quality that reverberates in our everyday lives, influencing our experiences and expectations. We seek quality in the products we consume, the services we avail ourselves of, the data we rely upon, and the environment we inhabit. More importantly, we seek it in our lives in the form of improved living standards, ethical conduct, and spiritual fulfillment.

From the quaint community named Quality in Kentucky, USA, to renowned brands like Quality Comics and Quality Records, the term 'quality' embodies a commitment to excellence and superior value. Even in music, the tone quality, dynamics, and texture all speak to the importance of quality in creating harmonious and evocative compositions. Because quality is the silent weaver of our world!

1.3 A Universally Relevant Pursuit

Whether you are launching a startup or leading an established business, the notion of quality is integral. It is the invisible thread that ties your products or services to customer satisfaction. Entrepreneurs constantly seek to comprehend and embed quality into their offerings, ensuring that what they bring to the market is the best it can be.

The impact of quality extends beyond the realms of commerce, reaching into the corridors of education and public policy. Educators striving to nurture future generations imbibe quality principles by designing curriculums that promote the significance of quality in personal and professional life.

Simultaneously, policymakers explore how these principles could enhance public governance, resulting in societal progress.

Quality also captures the interest of those outside traditional sectors. It appeals to advocates championing consumer empowerment, students exploring theoretical nuances, and even artists, musicians, and creatives keen on refining their processes. Indeed, for the curious observer who sees quality as an intriguing perspective to analyze the world, this concept offers a fascinating lens. Thus, regardless of your profession or interest, quality principles remain universally relevant and a transformative pursuit.

1.4 Finally, Quality is a Journey

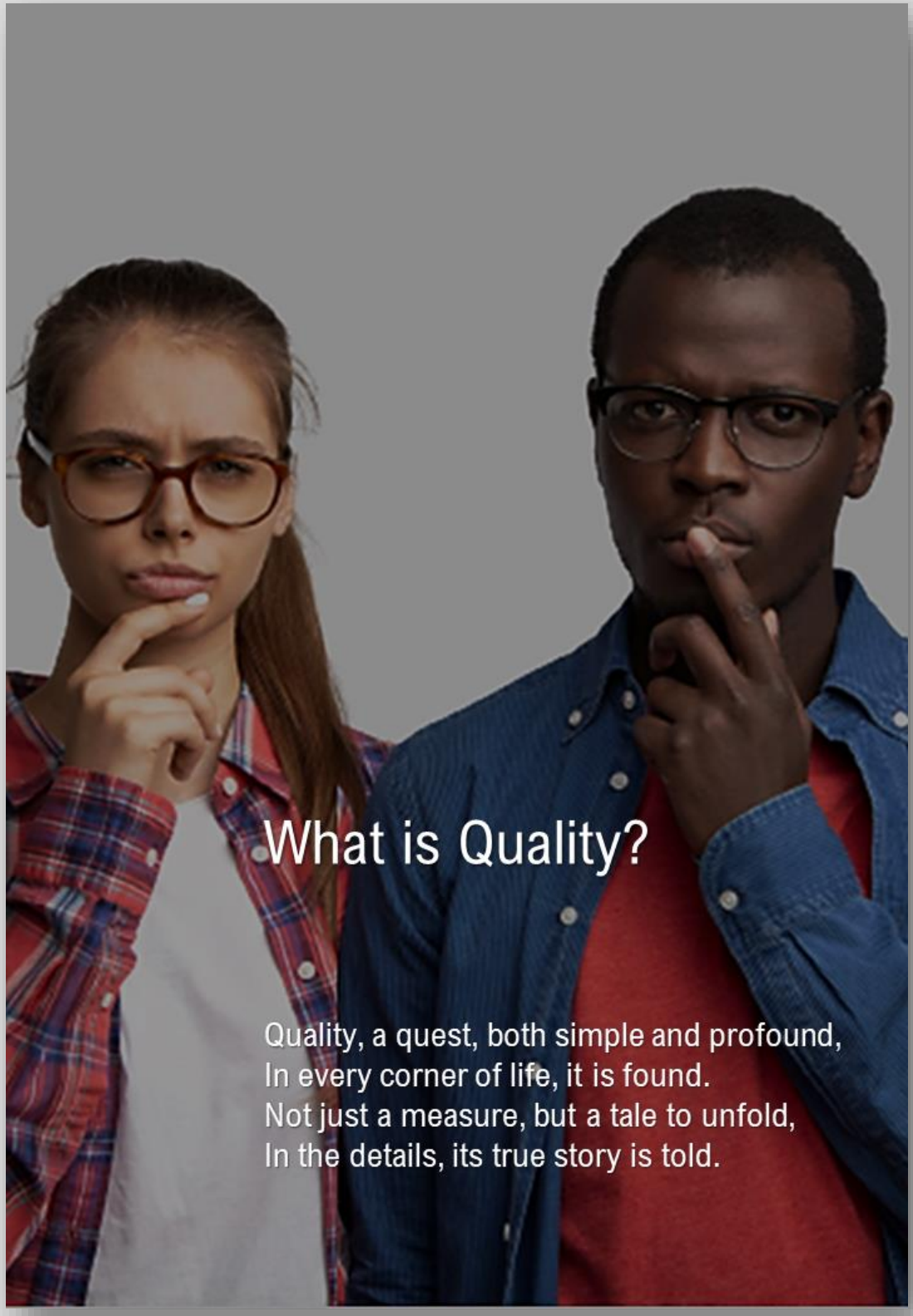
The pursuit and understanding of quality are a personal journey that extends beyond the realms of business and academia, touching every aspect of our lives. It is not a singular concept confined to a specific discipline but a universally relevant and transformative principle. It shapes our experiences, expectations, and endeavors, permeating our everyday lives with a pervasive influence.

The testament to the universality and significance of quality is such that almost every organization employs an Officer or a manager of Quality, Quality Assurance, Quality Control, or Quality Improvement. These roles are pivotal in ensuring that the principles of quality are consistently applied and improved upon. If you find yourself in an organization without such a position, then

perhaps you have identified a unique job opportunity, further underscoring the universal need for quality and its practitioners.

Quality, indeed, is everything, everywhere, and at every time. As we delve deeper into this book, we discover that quality is not merely an attribute to be achieved but an ongoing quest for excellence. It is a personal investment, a theoretical concept, a practical tool, and a universal principle all at once. It is our hope that this exploration of quality, in all its forms and manifestations, will enrich your understanding and appreciation of this profound concept, setting you on a path to leverage the power of quality in your personal and professional pursuits. This is the essence of quality, a journey that we have embarked on together and which will continue to shape our experiences and expectations in our quest for improved living standards, ethical conduct, spiritual fulfillment, and overall societal progress.

What more can we say other than that quality is a journey, requiring commitment, perseverance, and a continuous quest to improve what we understand about it?


What is Quality?
Quality, a quest, both simple and profound,
In every corner of life, it is found.
Not just a measure, but a tale to unfold,
In the details, its true story is told.

2 What is Quality?

2.1 Dictionary Meaning and Definition

The dictionary is usually the first place to go when seeking the meaning or definition of a word. We would begin by doing the same here in this book. But for the purpose of maintaining standards, in this book, the Oxford English Dictionary (OED) is used to discuss the general meaning and definition of the word 'quality.'

According to the OED, quality is:

A. *"the standard of something as measured against other things of a similar kind; the degree of excellence of something."*
    - Example: "an improvement in product quality"
    - Similar words: standard, grade, class, classification, calibre, status, condition, character, nature, constitution, make-up, form, rank, worth, value, level, sort, type, kind, variety.

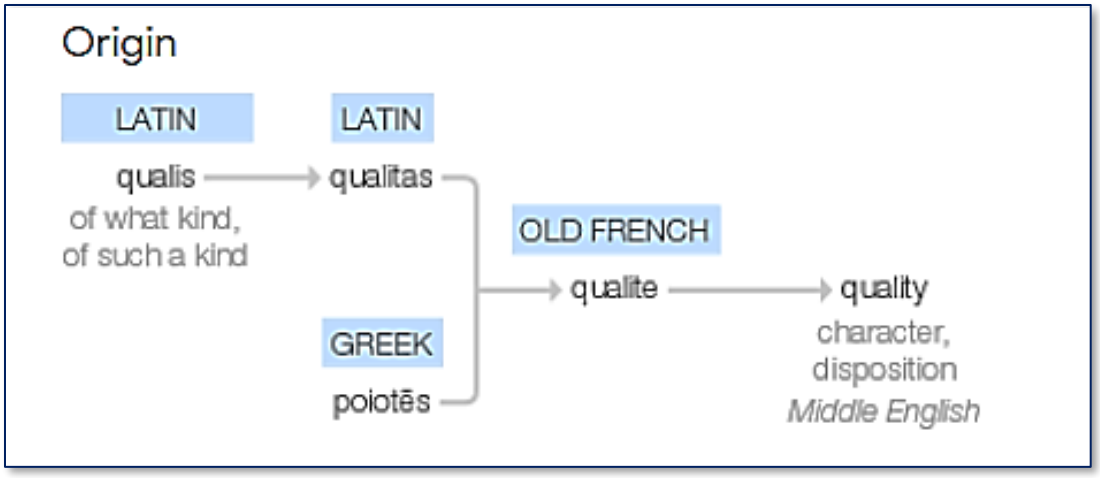
B. *"general excellence of standard or level; a high standard"*
    - Example: "a masterpiece for connoisseurs of quality"
    - Similar words: excellence, superiority, merit, worth, value, virtue, calibre, eminence, pre-eminence, supremacy, transcendence, distinction, refinement, incomparability, account,

talent, skill, skillfulness, virtuosity, expertise, brilliance, craftsmanship, flair, finish, mastery.

C. *"a distinctive attribute or characteristic possessed by someone or something." OR "a thing that is part of a person's character, especially something good"*
    - Example: "he shows strong leadership qualities"
    - Similar words: feature, trait, attribute, characteristic, point, aspect, facet, side, streak, property, peculiarity, idiosyncrasy, quirk, mark, badge, stamp, hallmark, trademark.

D. *"a feature of somebody/something, especially one that makes them different from somebody/something else"*
    - Example: "the special quality of light and shade in her paintings"

Before we analyze the foregoing definitions, let us quickly appreciate the historical perspectives, i.e., the origin of the word 'quality' - something quite uniquely interesting about the OED. The OED, **Box 1**, presents the word quality as originating from Latin *qualis* meaning 'of what kind', 'of such a kind' to *qualitas* (translating Greek *poiotēs*) to Old French *qualite* and then to Middle English (c1300) in the senses 'character, disposition' and 'particular property or feature'. By 1579–1813, the transitive verb form of quality was used, e.g., *'To provide with a quality or qualities; (in passive) provided with (good) qualities.'*



Box 1: Historical origin of the quality (Source: OED, 2023)

2.1.1 Quality: a versatile word in English

What is 'quality' in your language?

Fortunately, this book is written in the English language, and as a result, many more people other than our Hausa, Igbo, and Yoruba citizens of the world would also understand the versatility of the word quality on the same level. First, the word 'quality' can function as both a noun and an adjective or even a verb in English, and its meaning changes based on its usage as we have seen. Secondly, as we must have appreciated in the previous chapter, quality is a multi-faceted concept that permeates all aspects of life.

2.1.2 Analyses of the dictionary meaning and definition

1. The first definition focuses on the comparative and hierarchal aspects of quality, highlighting it as a measure of excellence or standard among similar items. For instance, the quality of a product is assessed based on its superiority or inferiority to other similar products. This usage often applies to tangible goods and services.
2. The second signifies inherent excellence or a high standard, not necessarily compared to anything else. The emphasis is on exceptional or intrinsic characteristics, which are often used in the context of craftsmanship, artistry, or even human talents.
3. The third definition is similar to the second but personalizes the concept of quality by applying it to individual characteristics or traits. This is often used in reference to human qualities such as leadership, empathy, or resilience.
4. The fourth definition describes quality as a distinguishing feature that sets someone or something apart from others.

We find quality being used in diverse contexts, confirming its ubiquitousness. Quality compares, places a level of excellence, distinguishes, confers uniqueness, and is a measure of merit, but it is applied in different contexts and has different connotations. With several overlaps in the synonyms across definitions, they each provide a nuanced understanding of the word "quality," depending on the context in which it is used. Nevertheless, the original sense from its Latin roots still remains as ‘character’ and ‘kind.’

Finally, it does seem that it may not be easy to define 'quality' in a way that encompasses all aspects. What constitutes quality can differ greatly depending on context, personal preferences, cultural perspectives, and various other factors. Luckily, in this book, we have found a unifying solution to this diversity, which you shall soon discover in subsequent sections of this chapter as you read on. So please read on.

2.2 Evolution of the Meaning and Definition of Quality

We believe it is important to take a brief tour back into the past to appreciate how the meaning and definition of quality evolved into what we just read from the OED. No doubt, human civilization (especially the industrial revolutions and quality management principles) and the ever-changing transformations of life on earth that man has observed and investigated have played a major role in this.

2.2.1 Historical perspectives on quality

The concept of quality has roots stretching back to ancient civilizations. Craftsmen of old were focused on creating goods of the highest standard, taking pride in their workmanship. This was an era where quality was largely synonymous with craftsmanship. But with the advent of the Industrial Revolution in the late 18th century, the concept of quality started shifting. The goal became to produce uniform, reliable goods on a large scale, leading to the birth of quality control.

The role of quality assurance became prominent in the mid-20th century, when the focus was not just on detecting and fixing problems but also preventing them from occurring in the first place. Thus, the late 20th and early 21st centuries saw a shift towards quality management, encompassing all organizational activities. The notions of Total Quality Management (TQM) and Six Sigma exemplify this era, emphasizing continuous improvement and the reduction of variation and waste.

2.2.2 Modern quality philosophies and theorists

We will briefly review a few well-known theorists and their distinctive philosophies in order to better understand how the modern understanding of quality has evolved:

1. **Frederick Winslow Taylor (early 1900s):** Quality is the capability of a product or process to perform its intended function without causing waste or inefficiency. His philosophy: "Making people work as hard as they could was not as efficient as optimizing the way the work was done." Taylor, the father of scientific management principles, emphasized improving quality and productivity.
2. **Walter A. Shewhart (late 1910–1920s):** Shewhart, who is also mentioned in the 1920s definitions, contributed to quality management with his definition of quality as the degree to which a product or process is free from inherent variability. Quality is the degree to which a product or

process can fulfill its intended purpose or meet the requirements specified by the customer.

3. **Edwards Deming (1950s):** Quality is the ability of a product or service to satisfy customer needs and expectations, leading to customer loyalty and market success. Deming emphasized the importance of a systematic approach to quality improvement and the reduction of variation in processes.
4. **Joseph M. Juran (1950s):** Quality is the fitness for use or the degree to which a product or service can meet customer needs and provide value. His Quality Trilogy is a systematic approach to managing quality. It includes quality planning (establishing the objectives and processes necessary to deliver results), quality control (ensuring the processes are working as planned), and quality improvement (constantly looking for better ways to do things). The concept of "fitness for use" as an alternative to traditional definitions of quality He emphasized that quality should be defined based on the specific requirements and needs of the users or customers. This definition shifts the focus from meeting specifications to meeting customer expectations.
5. **Armand V. Feigenbaum (1950s):** Quality is the total composite of characteristics that determine the value of a product or service. Feigenbaum introduced the concept of total Quality Control, which emphasizes the involvement of all members of an organization in ensuring quality.

6. **Philip B. Crosby (1970s):** Philip Crosby contributed to management theory and quality management practices. His concept, "Quality is Free," suggests that the costs of poor quality far outweigh the costs of preventing poor quality. He argues that organizations can save money in the long run by maintaining high quality standards. Crosby is also known for his "Zero Defects" quality management theory, which advocates doing things right the first time to eliminate costly rework. Quality is conformance to requirements or doing it right the first time. Crosby emphasized the prevention of defects and the importance of zero defects as a goal.
7. **Kaoru Ishikawa (1980s):** Ishikawa's most significant contribution to the field of quality management is the Ishikawa Diagram, also known as the Fishbone Diagram or Cause-and-Effect Diagram. This diagram is used in quality management to identify potential causes of a problem, discover its root causes, and visualize the relationship between the causes and the problem. This makes it easier to identify areas for quality improvement. Ishikawa believed that quality improvement was a continuous process that could always be taken one step further. Quality is a company-wide effort and the responsibility of every employee.

2.3 Emerging Perspectives on Quality

The following perspectives on quality have emerged, which, on closer examination, consider the significance and interpretations of both the OED's

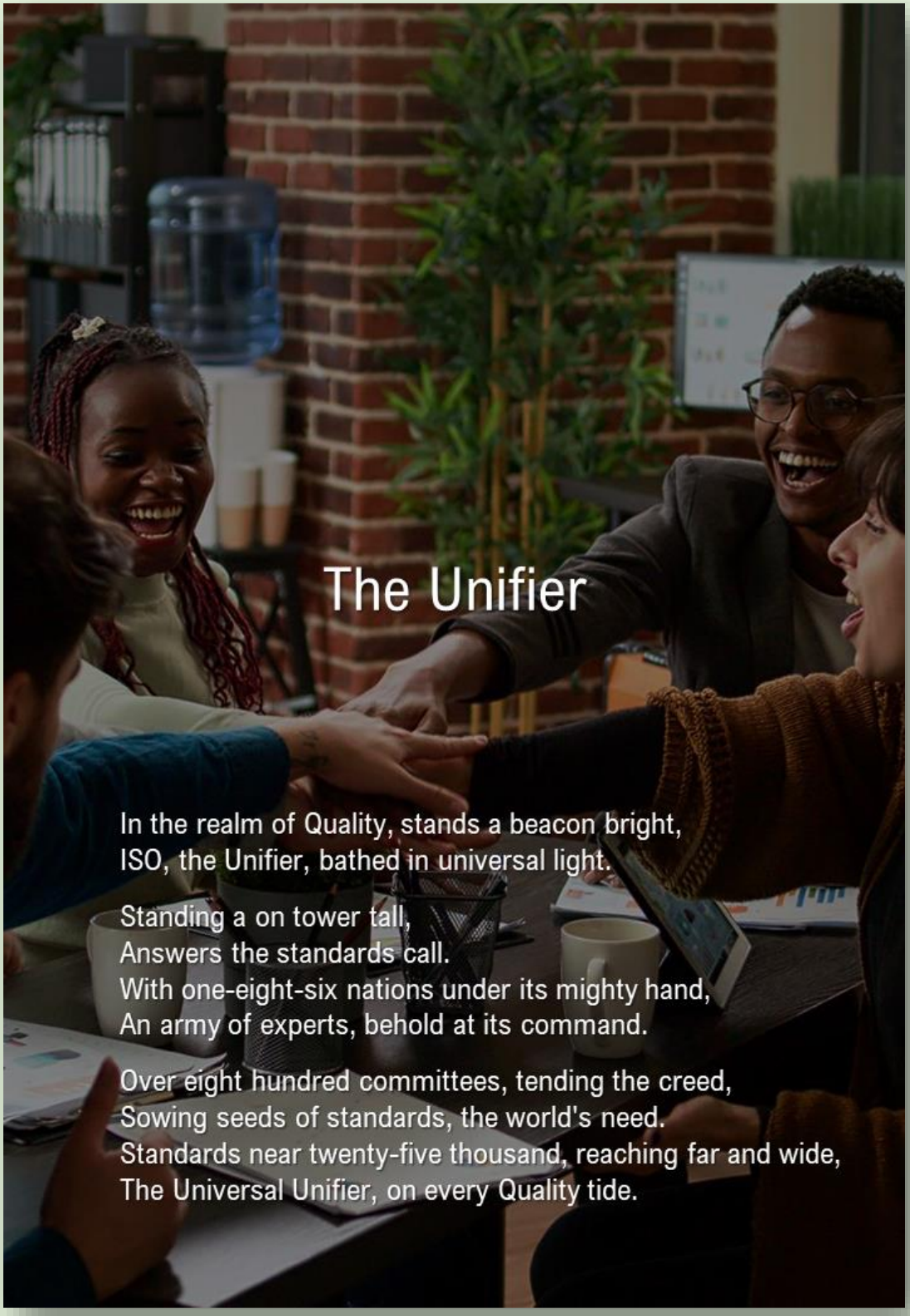
multifaceted definitions of quality as well as the operational definitions put forth by some well-known theorists, philosophers, and management experts:

1. **Fitness for Purpose and User-Centric:** Quality is the extent to which a product or service meets its intended use or fulfills the needs and expectations of its users. In today's user-centric approach, quality is often defined by the user experience. It encompasses factors such as usability, ease of use, accessibility, and emotional satisfaction. This perspective acknowledges that quality is not solely determined by technical specifications but also by the user's interaction and perception.
2. **Customer and Stakeholder Satisfaction:** Similar to fitness for purpose and user-centric, quality here, is the consistent capability of a product or service to meet or exceed customer expectations and bring about a high level of satisfaction. It is also the ability of a product, service, or organization to meet the expectations and requirements of all relevant stakeholders, including customers, employees, suppliers, and society at large.
3. **Continuous Improvement:** Quality is a dynamic concept that involves an ongoing process of identifying and eliminating defects, errors, and inefficiencies to improve performance and customer value.
4. **Zero Defects or Defect-Free Production:** Quality is the achievement of error-free performance, aiming for the elimination of any non-conformance or deviation from established standards. Quality is the prevention or elimination of defects in the manufacturing or production

process, resulting in products that are free from flaws, errors, or deficiencies.

5. **Reliability and Durability:** Quality is the ability of a product or service to perform consistently and dependably over time without experiencing failures, breakdowns, or deterioration.
6. **Process-Based and Process Excellence:** Quality hinges on efficiently managing processes to yield predictable results, reducing errors and waste. This view underscores the value of robust processes for consistently delivering desired products or services.
7. **Value-Based and Value for Money:** The balance between a product's or service's price and the benefits or value that the customer perceives is what determines quality. It emphasizes delivering the highest quality at the most optimal cost.
8. **Conformance to Specifications:** Quality is the degree to which a product or service adheres to established standards, specifications, or requirements.

Can there be a single perspective that unifies them all? Yes, we believe so. Let us proceed to appreciate this in the next chapter!


The Unifier
In the realm of Quality, stands a beacon bright,
ISO, the Unifier, bathed in universal light.
Standing a on tower tall,
Answers the standards call.
With one-eight-six nations under its mighty hand,
An army of experts, behold at its command.
Over eight hundred committees, tending the creed,
Sowing seeds of standards, the world's need.
Standards near twenty-five thousand, reaching far and wide,
The Universal Unifier, on every Quality tide.

3 ISO Definition of Quality

3.1 The Unifier: ISO 9000:2015

It is possible to view the International Organization for Standardization's (ISO) definition of quality as a unifier of all earlier definitions and viewpoints. According to ISO 9000:2015, 'Quality Management Systems: Fundamentals and Vocabulary, quality is defined as "*the degree to which a set of inherent characteristics fulfills requirements*."

This definition is so simple, straight-forward, and compacted with so much wisdom, demonstrating the number of quality heads that have put it together. Now, let us carefully unpack it for a better understanding.

First, "*the degree to which...*" indicates a measure for comparison, relative to an assigned level or grade, etc., which can be used to qualify or quantify with words or figures such as poor, moderate, high, or good, fair, poor, or 50%, 5.4cm, 1:4, 3/7, five times, excellent, or acceptable, making a comparison against (e.g., standard), between or within things. All these are relatable to the earlier conceptions presented in the OED. Simply put, this part of the definition places quality as a relative measure!

Secondly, "*a set of inherent characteristics...*" This certainly refers to anything or everything! Indicating the nature of things (living or non-living, objective or

subjective), the 'what' of the 'thing' in question, or about the attribute(s) of the 'thing' that are in focus, of concern, or of interest at a particular point in time. For example, the inherent characteristics of a product or service. It is the 'item,' the 'what' being measured or judged and can be taken into the comparison mentioned above. Interestingly, however, we find the use of the word 'characteristics' in this ISO definition, which links us back to the word 'character' used in the origin of quality, explained earlier (**Box 1**) by the OED.

Thirdly, "... *fulfills requirements*." This is what actually helps us confirm whether the "degree" can be acceptable, excellent, bad, etc. This part of the definition simply defines quality as being able to meet set criteria! For example, the measure of 5.3cm obtained on a meter rule about the 'what' of a 'thing' would have no meaning until it was compared against what was required by the criteria. Thus, if 5.0cm was required, then 5.3cm is exceptional or beyond expectation, while if 6.0cm was required, 5.3cm would indicate that it is below requirement and perhaps unacceptable or unsatisfactory.

The word '*requirements*' in the ISO definition is the crux of the unifier. It brings together all the contexts and viewpoints where a criterion states, stipulates, or specifies the relative measure of character(s), be it by:

1. Standard
2. Law (Statutory) and Regulator (Regulatory)
3. Customer
4. Organization
5. Product

6. Service
7. Process

Finally, we can now connect the third part of the definition of quality by ISO to the emerging perspectives on quality presented earlier in the last section of the previous chapter. There, we find quality being defined by diverse contexts in which any one of the seven requirements listed here gives a varying perspective.

In light of ISO's articulate definition, quality stands as a dynamic bridge between diverse definitions of the past and the present. Simplified yet enriched, it is a harmonious blend of measure, the essence of the 'thing,' and its relation to requirements. This tripartite interpretation not only illuminates the intricacies of quality but also magnifies its essence as a constantly evolving yet steadfast benchmark across varying spectrums.


ISO
About ISO
ISO (International Organization for Standardization) is an independent, non-governmental international organization with a membership of 168 national standards bodies. There is only one member per country. There are 819 technical committees and subcommittees to take care of standards development.
Through its members, it brings together experts to share knowledge and develop voluntary, consensus-based, market relevant International Standards that support innovation and provide solutions to global challenges.
The ISO has developed 24,869 standards, covering almost all aspects of technology, management and manufacturing.
SOURCE: https://www.iso.org/about-us.html -August, 2023
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3.1 Standards

Standard are established criteria or guidelines set by relevant authorities that ensure products, services, practices, or processes are safe, reliable, and confirm and conform to the status of quality for which they were established. They act as a framework to achieve and maintain high-quality performance across different sectors.

By the way, standard and quality are used to define one another. Even the OED uses quality to define standards, and it usually comes first in many instances when we ask about it in a typical classroom setting. But why is it so? Let us quickly look at the interwoven semantics and their justifications:

1. **Historical Evolution of the Terms:** Words evolve in tandem with society's needs and cultural shifts. Historically, both 'quality' and 'standard' originated in contexts that focused on merit, excellence, and a set criterion. As manufacturing, trade, and scientific methods advanced, the need for consistent and dependable benchmarks, or "standards," became paramount. This overlap in their developmental context naturally aligned the terms.
2. **Objective Measure versus Subjective Assessment:** Quality, in its broadest sense, includes a subjective assessment of merit or worth. It is nebulous and can differ between individuals based on perception. On the other hand, a 'standard' offers an objective, tangible benchmark or reference point. When we say something is of 'high quality', we imply it meets or

exceeds a certain accepted 'standard'. The use of 'standard' provides an objective basis for the subjective notion of quality.

3. **Universality and Consistency:** Standards are set to ensure consistency and reliability. When a product meets a particular standard, it assures users of a certain level of quality, irrespective of where they are or who made the product. This universality inherently ties the concept of standards to quality.
4. **Role in Industrialization:** The industrial revolution played a significant role in cementing the relationship between these terms. With mass production, there was a pressing need to ensure each product was of consistent quality. This led to the establishment of standards against which quality was measured.
5. **Economic and Trade Implications:** In commerce, to assure foreign and local buyers of the quality of goods, standards were employed. If a product met international standards, it was seen as a hallmark of quality, facilitating trade and fostering trust.
6. **Linguistic Simplification:** Linguistically, humans prefer simplification. Using 'standard' as synonymous with 'quality' streamlines conversations, especially in contexts where benchmarks and comparatives are key. Over time, due to frequent usage, the overlap between 'quality' and 'standard' became linguistically cemented.
7. **Interdisciplinary Usage:** Both terms are used across various disciplines, from manufacturing to academia, from the arts to the sciences. In each

context, the adherence to a set standard often denotes a level of quality, further intertwining their usage.

8. **Dictionaries Reflect Societal Usage:** Dictionaries, including the OED, do not just prescribe language; they describe it. The mutual definition of 'quality' and 'standard' in the OED reflects their intertwined usage in society. It is a linguistic mirror of societal norms.

In brief, the synonymy of 'standard' with 'quality' is a confluence of historical evolution, industrial needs, linguistic tendencies, and the inherent nature of the terms. Both words serve as mutual touchstones, each illuminating and refining the other's meaning in a cyclical dance that underscores their enduring relevance.

Finally, it should be noted that standards generally exist as written documents, evolve as interpretation deepens, and are integral across various sectors, industries, and contexts. While ISO is renowned for its international standards, there are multiple forms and types of standards that cater to different needs and purposes. **Box 2** below presents the types and categories of standards with examples.

Type	Category	Example
Spiritual & Religious Standards	Moral and Ethical Codes	Ten Commandments (Christianity), Eightfold Path (Buddhism)
	Rite Standards	Ablution/Salat (Islam), Communion (Christianity)
	Dietary Laws	Halal (Islam), Kosher (Judaism)
	Behavioural Conduct	"Turning the other cheek" (Old Testament - Christianity), Ahimsa (Jainism)
Philosophical Standards	Ethical Theories	Utilitarianism, Kantian ethics
	Lifestyles	Stoicism, Minimalism
Cultural & Societal Standards	Norms and Mores	Dress codes, greetings, dining etiquettes
	Traditions	Cultural festivals, rites
	Aesthetics	Architectural styles, fashion trends
Technical & Industrial Standards	Industry Standards	USB ports (tech), tire tread depths (automotive)
	National Standards	ANSI (U.S.), BSI (U.K.), SON (Nigeria)
	Company/Corporate Standards	Internal product quality, ethical guidelines
	International Standards	ISO, IEC
	Professional and Technical	Engineering ethics, medical practices
Legal, Regulatory & Voluntary Standards	Constitutional (Legislative)	Voting age (Laws of a Nation)
	Mandatory (Regulatory)	Maximum chemical content in drinking water
	Voluntary	'Cruelty-free' badges
Development & Adoption Standards	Consensus Standards	Collaborative standards made by industry experts and consumer groups
	De Facto Standards	QWERTY keyboard layout
Environmental Standards	Environmental and Sustainability	Green production practices, carbon footprint reduction
Personal Standards	Individual Morality	Personal belief systems based on upbringing, experiences, and reflections
Mystical Standards	Esoteric Practices	Alchemy, Kabbalah
Self-help & Personal Growth	Mindfulness & Meditation	Zen meditation, Vipassana
	Life Coaching	Goal setting, self-improvement techniques, work-life balance strategies

Box 2: Types and categories of standards with examples

3.2 Statutory and Regulatory Requirements

Statutory and regulatory requirements are terms you might often come across, especially when discussing **standards** and compliance and quality management in various industries. At first glance, they might seem a bit technical, but they are integral to understanding how laws, legislation, regulations, and rules apply to quality in different sectors.

3.2.1 Statutory requirement

According to ISO 9000:2015, a statutory requirement is an "*obligatory requirement specified by a legislative body*." Essentially, it is something that the law, whether national or international, says we must do. Let us take, for example, Nigeria's constitution (i.e., Standard), which stipulates that for one to be eligible to vote, they must be at least 18 years old. This age limit is a statutory requirement; it is a law that has been formally written into Nigeria's governing documents.

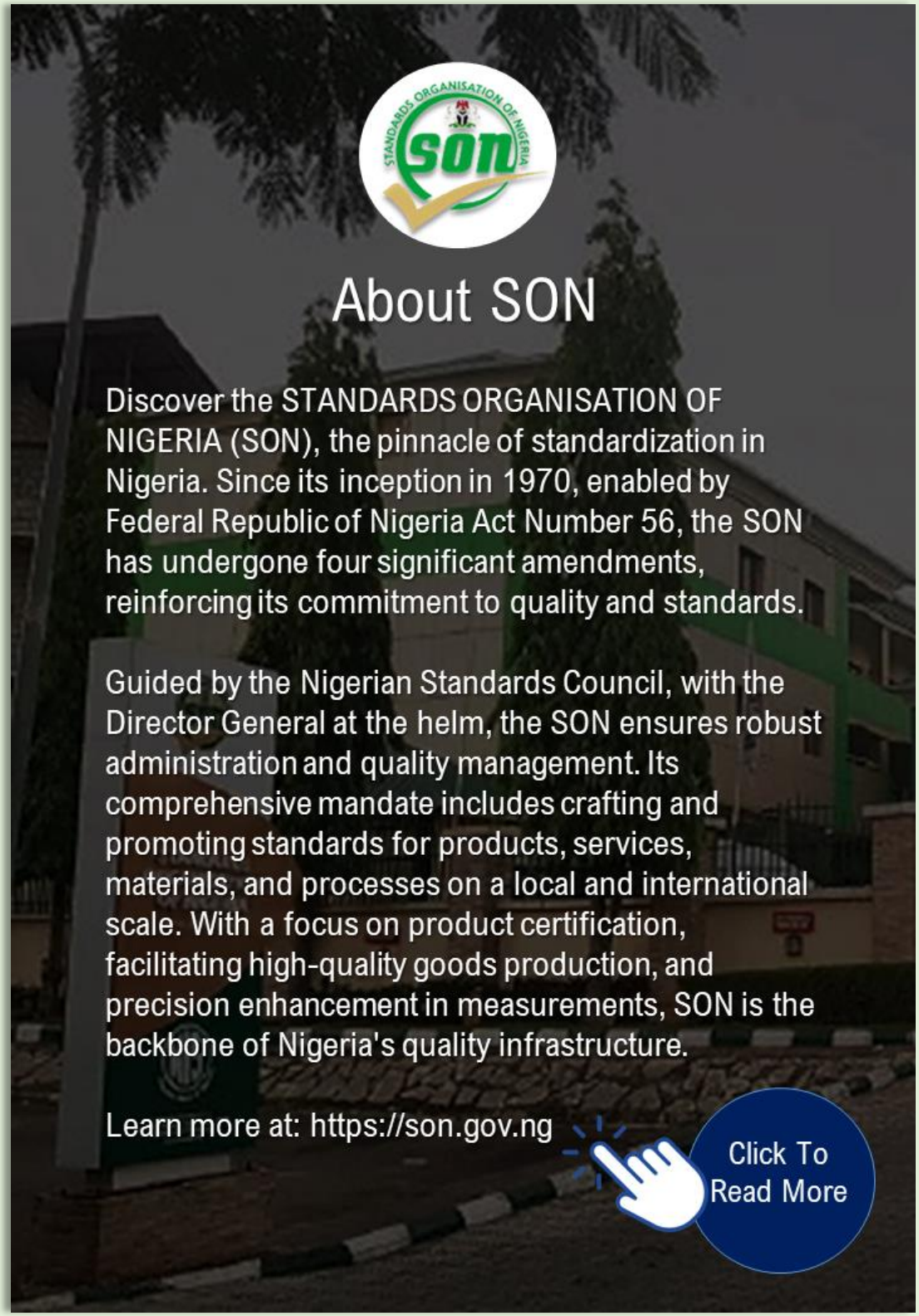
3.2.2 Regulatory requirement

According to ISO 9000:2015, a regulatory requirement is an "*obligatory requirement specified by an authority mandated by a legislative body*." Therefore, the authorized body, often established by the original legislation, develops guidelines to ensure the law's smooth implementation. Building on our example of an eligible age to vote, the Nigerian constitution states the age requirement, and the Independent National Electoral Commission (INEC), the regulatory

body, sets regulatory requirements concerning the voter registration process. These could include the type of identification needed to prove one's age, the period within which one needs to register before an election, and the steps involved in the registration process. These regulatory details ensure that the broader statutory requirement (the voting age) is upheld and clarified for practical purposes.

Among several other important examples is that which the Standards Organization of Nigeria (SON), as a regulator of the quality of products and services, deals with directly. The Nigerian government, understanding the significance of ensuring the quality and safety of products imported into the country, enacts a law mandating a conformity check for such products. This overarching law that demands products be in sync with the Nigerian Industrial Standard (NIS) or its approved equivalent before being imported is a statutory requirement. In response to the government's statutory demand, SON introduced the SONCAP process. SONCAP stands for the pre-shipment verification of conformity to standards. Before any product is shipped into Nigeria, it undergoes verification under SONCAP to ascertain that it aligns with the NIS or its approved equivalent.

Finally, from **Box 2** above, we find that a statutory requirement is a specified type of Standard that relates, for example, to the law of a country, and that regulators are its drivers, ensuring the fulfillment of the requirements of the law through guidelines, rules, and regulations. Failure to meet the requirements indicates failure to meet quality!


About SON
Discover the STANDARDS ORGANISATION OF NIGERIA (SON), the pinnacle of standardization in Nigeria. Since its inception in 1970, enabled by Federal Republic of Nigeria Act Number 56, the SON has undergone four significant amendments, reinforcing its commitment to quality and standards.
Guided by the Nigerian Standards Council, with the Director General at the helm, the SON ensures robust administration and quality management. Its comprehensive mandate includes crafting and promoting standards for products, services, materials, and processes on a local and international scale. With a focus on product certification, facilitating high-quality goods production, and precision enhancement in measurements, SON is the backbone of Nigeria's quality infrastructure.
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3.3 Customer Requirements

Customer is a broad term used for a person, group of people, or organization that can be internal or external to the organization that it does transactions with. The transactions may not necessarily be commercial in nature. However, the customer does receive a product or service from an organization. Examples of other general terms that have been used alternatively for customer are consumer, client, receiver, beneficiary, purchaser, stakeholder, interested party, etc.

Customer requirements refer to the needs, desires, expectations, and preferences that customers express or imply in relation to a product or service. These provide a foundation for the development, production, and delivery of products or services, including standards that cater to the requirements of the customer. Understanding and meeting customer requirements is crucial for the success of any business, as it directly affects customer satisfaction and loyalty.

Your guess would be as good as mine: if left alone? The range of customer requirements would be as varied as the collective characteristics of individual human nature, including the multitude of combinations that arise through their engagement within organizational contexts. Hence, to control excessive divergence, there is a need for the quality standards mentioned earlier, coupled with statutory and regulatory requirements, which the customer also requires, whether expressed or implied.

Successful businesses are those that are able to modify products, services, and processes with innovation to meet customer requirements without compromising applicable standard, statutory, or regulatory requirements. These are often referred to as customer-centered or customer-centric approaches to meet and exceed customers' expectations, enhancing their satisfaction. In the end, customer requirements are influenced by the type of customer and the types of organization, product, service and process involved.

3.3.1 Functional and non-functional requirements

Customer requirements can be grouped into two major classes. The functional requirements relate to the core purpose of the product or service. For instance, if a customer is buying a printer, they might expect it to have features like color printing, duplex printing, and wireless connectivity, while the non-functional requirements are not directly related to the main function of a product or service but are concerned with auxiliary aspects. For the printer example, non-functional requirements could include aesthetics, noise levels, or the size of the device.

It is usually in the non-functional aspect that the largest number of what customers "wants" rather than "needs" exist. The non-functional aspect is also the one that product and service providers (organizations) can easily change or manipulate for the customer. Interestingly, this aspect tends to mostly influence customer satisfaction because they take the functional aspects for granted since they are generally being standardized, legislated, or regulated.

3.3.2 Exercise: separating wants from needs

Enumerated in **Box 3**, below are some of the customer requirements, whether functional or non-functional; can you separate them?

Requirement	Description	Example
Functionality	Refers to the primary utility or tasks a product or service can accomplish.	A microwave oven that has a defrost setting.
Compatibility	Ensures a product or service works well with others a customer might already use.	A printer that is compatible with various computer operating systems.
Options	Offering variety or customization features to cater to different customer needs and preferences.	A video streaming platform that lets users choose between different streaming qualities based on their internet connection.
Durability	Refers to the overall robustness and long-lasting nature of a product.	A wristwatch that is water-resistant up to 50 meters and built to last.
Performance	Relates to the efficiency and effectiveness with which a product or service carries out its functions.	A sports car that accelerates from 0 to 60 mph in under 4 seconds.
Convenience and Efficiency	Concerns products or services that are designed to optimize user efforts and save time.	A dishwasher that has a "quick wash" cycle for lightly soiled dishes.
Regulatory and Compliance	Ensures products or services meet certain standards or certifications.	A toy that is certified to be lead-free and safe for toddlers.
Price and Cost	Pertains to the monetary value of a product or service in relation to customer's perceived value and budget constraints.	A high-end smartphone offering installment payment options for budget-conscious consumers.
Safety and Risk Management	Involves ensuring products or services are safe to use and the management of associated risks.	A hiking shoe brand offering a warranty against manufacturing defects.
Design and Experience	Relates to the aesthetic appeal, usability, and overall user experience when interacting with a product or service.	A music player application with an intuitive interface and visually appealing album art display.
Sustainability	Ensures products or services have minimal negative environmental impacts or promote positive	A coffee brand using biodegradable packaging.

Requirement	Description	Example
	environmental contributions.	
Transparency and Information	Represents open and honest communication about products, services, or company practices.	A skincare brand detailing all ingredients transparently on the product label.
Control and Customization	Allows customers to tailor their interaction or a product according to their preferences.	A travel booking website that allows users to customize holiday packages.
Accessibility	Ensures products or services can be used by everyone, irrespective of their abilities.	An e-commerce website optimized for visually impaired users with screen reader capabilities.
Privacy and Data Management	Refers to how customer data is managed, ensuring security and privacy standards.	An online store using end-to-end encryption for customer transaction data.
Empathy and Understanding	Emphasizes a genuine understanding and catering to customer needs and feelings.	A hotel chain offering free stay extensions for guests impacted by flight cancellations.
Post-purchase Support and Complaint	Pertains to products and services support provided after a sale, which includes complaints channels of communication with consumers.	A laptop manufacturer providing 24/7 technical support for its users and means contacts or suitable platforms for complaints and redress.

Box 3: Types and categories of standards with examples

With respect to the last example on complaints, the Federal Competition and Consumer Protection Commission (FCCPC) of Nigeria, amongst other regulatory responsibilities, protects the rights of consumers when dissatisfied by ensuring that organizations meet the requirements for handling consumer complaints. The Commission would investigate such complaints, safeguarding that consumers receive the promised quality support. If consumers lodge complaints about inadequate post-sale support or the inability to communicate their grievances, the FCCPC can mandate corrective actions, ensuring businesses adhere to quality and consumer protection standards.


FCCPC
About FCCPC
The Federal Competition and Consumer Protection Commission (FCCPC) of Nigeria aims to safeguard consumer rights by ensuring access to quality products and services at competitive prices and verifying their safety for intended use.
The Commission monitors businesses to prevent anti-competitive practices and monopolies. They assess mergers, conduct market surveillance, and handle consumer complaints. Emphasis is placed on quality assurance, ensuring products meet national and international standards.
Furthermore, the FCCPC educates consumers and businesses, communicates strategically using various media, offers legal services to maintain market competition, and relies on research and statistics to inform its strategies and interventions.
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3.4 Organizational Requirements

An organization is a unique entity, made up of one person or a group of people, that operates with specific duties and powers to realize its goals. Examples are vast and diverse, ranging from an individual selling goods (a sole trader) to larger structures like companies and corporations. They could be business-focused entities like firms and enterprises or more regulatory ones like authorities. It is not just about profit; organizations can also be charitable or informative, such as charities and institutions. Think of it as a unit with a purpose! Existing officially (incorporated) or unofficially and operating in the public or private sector. Henceforth, in this book, the use of the word 'organization' actually refers to this definition.

Organizational requirements refer to the unique set of criteria, needs, or conditions that an organization establishes to achieve its specific objectives. These requirements are intrinsic to the organization's vision, mission, values, strategies, and operational needs. They serve as the foundation upon which the organization bases its decisions, strategies, and operations. The establishments these requirements are also influenced by the stakeholders including customers and regulators involved, as well as products, services and processes.

The followings are features and examples of organizational requirements:

1. **Inherent nature and Quality Standards:** One striking feature of these requirements is their inherent nature. Unlike the imposed benchmarks

from external stakeholders, such as regulations or customer expectations, organizational requirements are borne out of self-imposed directives. A classic example can be found in the realm of quality standards. Organizations, in their pursuit of excellence, often architect their own quality standards, sometimes exceeding what external regulatory bodies might prescribe. This self-imposed excellence ensures that the organization not only adheres to the market's demands but also becomes a torchbearer of quality in its domain.

2. **Mission, vision and ethical protocols:** A close examination reveals that these requirements are meticulously crafted to align with the organization's overarching mission and vision. It is as if the organization sets its own compass, making certain that each of its strategies resonates with its foundational purpose. For instance, ethical protocols, established by numerous entities, embody this alignment. These codes of ethics or conduct guidelines, though diverse in their specifics, echo the broader purpose, values, and ethos of the organizations they originate from.
3. **Operational efficiency and communication frameworks:** Operational efficiency is another cornerstone of organizational requirements. Through the establishment of specific criteria, organizations aim to enhance their processes, curtail inefficiencies, and harness resources optimally. A vivid illustration can be discerned in the formulation of standard operating procedures and communication frameworks. By prescribing how information percolates across various echelons, departments and units,

organizations ensure a seamless operational flow, bridging potential gaps and ensuring synergy.

4. **Risk management stakeholder engagement and capacity building:** Risk management and stakeholder engagement are other domains where organizational requirements become evident. The former involves the crafting of strategic blueprints to mitigate potential threats, while the latter entails balancing and catering to an array of internal interests, from employees to shareholders. Furthermore, organizational requirements do not exist in isolation. They often intersect with the fabric of organizational culture, manifesting as norms and guidelines that sculpt the daily operations and interpersonal dynamics within the entity. For instance, training and development initiatives, instituted by several organizations, not only amplify the skills of their workforce but also reinforce the cultural tenets, promoting a milieu of continuous growth, learning and a system that ensures the preservation of the unique knowledge base of the organization.

In summation, organizational requirements are more than mere criteria or conditions. They are the lifeblood of an organization, intrinsically linked to its identity, operations, and aspirations. These self-imposed mandates not only steer the organization on its chosen path but also fortify its position in an ever-evolving marketplace, ensuring resilience, competitiveness, consistency, and sustainable evolution.

3.5 Product Requirements

Product requirements specifically pertain to the set of criteria that a given product must fulfill to meet its intended purpose and the expectations of its target audience. These requirements can be multifaceted, encompassing both tangible and intangible, functional and non-functional attributes, which generally relate to the type of product and the customers for whom the products are made.

Before we go deep into product requirements, let us quickly appreciate the different basic categories of products that influence the requirements.

3.5.1 Types of products

1. **Consumer Goods** are products purchased and consumed by the final user.
    - *Convenience goods* are products that consumers frequently purchase with minimal thought, such as toothpaste, bread, or medicine.
    - *Shopping goods* are items that consumers compare for quality, price, or style before making a choice. Examples include clothing, appliances, or furniture.
    - *Specialty Goods:* These have unique characteristics and are often branded, such as luxury cars, designer bags, or high-end electronics.

- *Unsought goods* are products that consumers do not necessarily think of buying until they need them, like insurance or funeral services.

2. **Industrial goods** are products used in the production of other goods or for business operations.
    - *Raw Materials:* Basic substances in their natural state, such as cotton or iron ore.
    - *Manufactured Materials and Parts:* Produced from raw materials and used to make a final product, like computer chips or automobile parts.
    - *Capital Items:* Industrial products that aid in the production process but do not become a part of the final product, such as machinery or warehouse facilities.
3. **Digital/Electronic Products:** Virtual products that exist in electronic format, like e-books, software applications, and digital music.

3.5.2 Features of product requirements

1. **Functional Requirements:** These are the basic operational necessities of a product. For instance, a smartphone should be able to make calls, access the internet, and capture photographs. For some consumers, beyond calls and text messages other futures like internet and photography are non-functional.

2. **Aesthetic Requirements:** These relate to the visual, tactile, and other sensory attributes of a product. The sleek design of modern gadgets or the pleasing hue of a dress can fall into this category.
3. **Safety and Compliance:** The product must adhere to certain safety standards and regulatory guidelines. For example, children's toys should be free from harmful chemicals.
4. **Reliability and Durability:** This relates to the lifespan of the product and its performance over time. A watch, for instance, is expected to provide accurate timekeeping for years.
5. **Environmental and Ethical:** With rising awareness, many consumers demand products to be sustainably manufactured, like cruelty-free cosmetics or eco-friendly packaging.

3.6 Service Requirements

Service requirements describe the criteria that a particular service should achieve to ensure functional efficacy and customer satisfaction. Unlike products, services are mainly intangible, making their requirements often subjective and experiential in nature. Again, let us quickly look at the broad classifications of services to enable us easy understanding of features of service requirements.

3.6.1 Types of services

1. **Business Services:** Provided to fulfill the needs of businesses.

- *Professional Services:* These require specialized skills and training. Examples are accounting, legal services, or consulting.
- *Financial Services:* Pertaining to the management of money and assets This includes banking, insurance, and investment advice.
- *Information Technology (IT) Services:* Covering areas related to technology like software development, IT consulting, and cybersecurity services

2. **Personal Services:** Targeted at individual consumers.
    - *Health and Wellness:* Services such as medical treatments, therapy sessions, or fitness training.
    - *Leisure and Entertainment:* Includes services like movie theaters, amusement parks, or recreational activities.
    - *Beauty and Grooming:* Services like salons, spas, and personal grooming facilities.
3. **Public Services:** Usually offered by governments to serve the public good.
    - *Healthcare Services:* Public hospitals, clinics, and healthcare programs.
    - *Education Services:* Public schooling, vocational training, or community education programs.
    - *Utility and Administrative Services*: Publicly provided or regulated services such as water supply, security, electricity, or waste management.
4. **Online Services:** Provided through the internet.

- *Streaming Services:* Platforms offering music, videos, or series online, like Netflix or Spotify.
- *E-commerce Services:* Online platforms facilitating buying and selling, like Amazon or eBay.
- *Cloud Services:* Platforms providing online storage, software, or processing power, such as Google Drive or AWS.

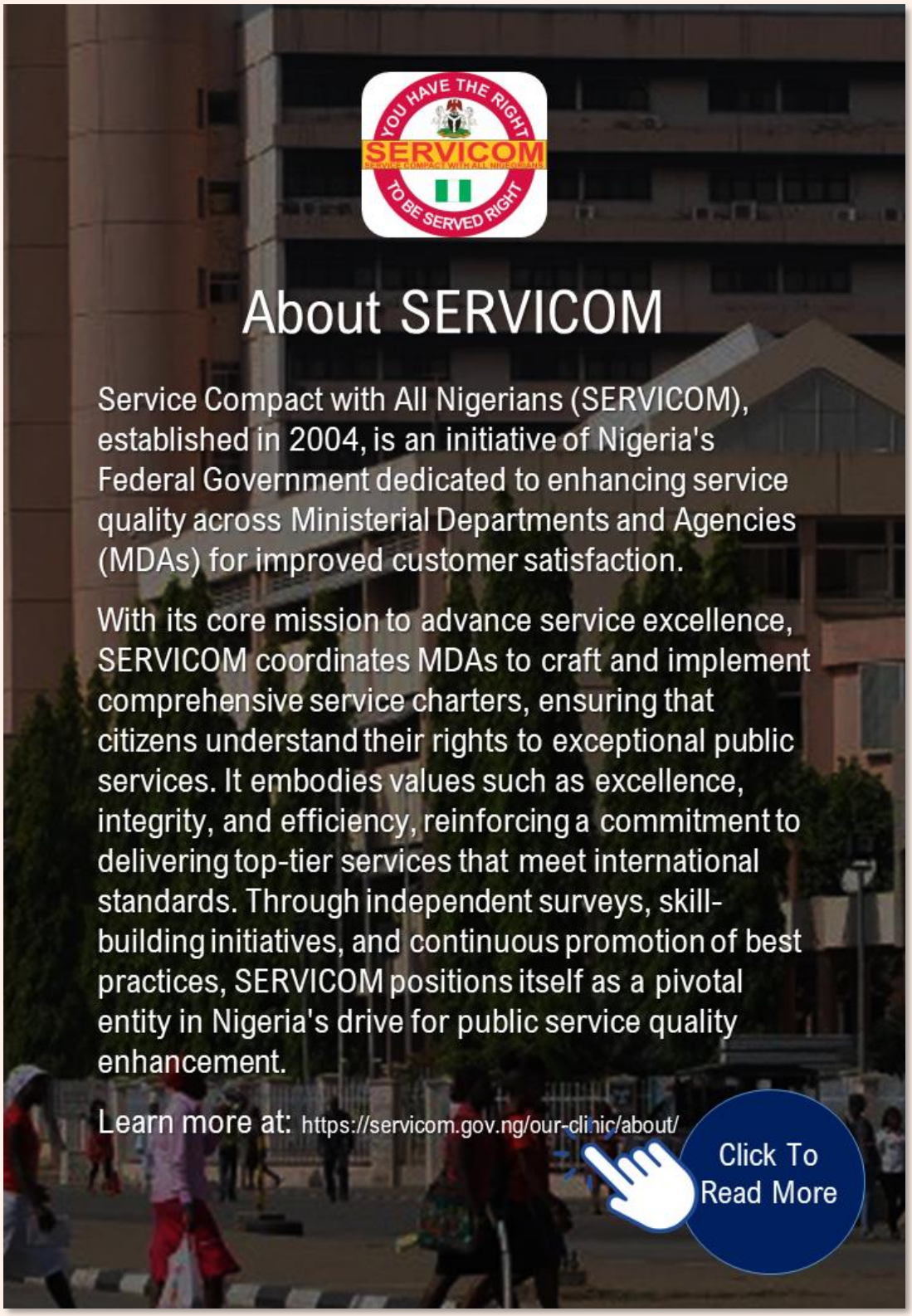
3.6.2 Features of service requirements

The features of service requirements exhibit a high degree of diversity and abundance, mostly attributable to the intangible and dynamic nature of services. The following are a few of the basic features that cut across diverse industry sectors:

1. **Availability and Accessibility:** Services should be easily accessible to the intended users. For example, the use of digital platforms to make services user-friendly and available across devices.
2. **Reliability:** Customers should be able to trust the consistency of the service. Think of an online banking system that is expected to be secure and available 24/7.
3. **Responsiveness:** How quickly and efficiently a service responds to user needs is critical. For example, a customer support helpline should ideally resolve queries in the shortest possible time.

4. **Customizability:** Given the diverse needs of consumers, some services should offer customization. A software-as-a-service platform might allow businesses to tailor features based on their unique requirements.
5. **Interpersonal Dynamics:** Especially for services that involve direct human interaction, the behavior, expertise, and approachability of the service provider play a pivotal role. A doctor's bedside manner or a teacher's approachability, for instance, can significantly influence service perception.

Let us consider the SERVICOM dimensions that offer a comprehensive framework for enhancing public service delivery in Nigeria. **Service Delivery (30%)** emphasizes the core of any service: its efficiency and effectiveness. This aligns with the features of availability and accessibility, ensuring that services not only exist but are rendered optimally. **Timeliness (24%)** dovetails with responsiveness, stipulating that public services should be prompt, reducing bureaucratic delays, and responding swiftly to public needs. **Information (18%)** resonates with the need for transparency and clarity, ensuring citizens are well-informed, akin to the service requirement of accurate and timely information dissemination. **Professionalism (16%)** underpins the service feature of reliability, demanding that public servants possess the requisite skills and adhere to ethical standards. Lastly, **Staff Attitude (12%)** echoes interpersonal dynamics, underscoring the importance of cordiality, empathy, and positive interactions in public service engagements. Together, these dimensions aim to elevate the quality of public services to meet and exceed citizen expectations.


YOU HAVE THE RIGHT
SERVICOM
TO BE SERVED RIGHT
About SERVICOM
Service Compact with All Nigerians (SERVICOM), established in 2004, is an initiative of Nigeria's Federal Government dedicated to enhancing service quality across Ministerial Departments and Agencies (MDAs) for improved customer satisfaction.
With its core mission to advance service excellence, SERVICOM coordinates MDAs to craft and implement comprehensive service charters, ensuring that citizens understand their rights to exceptional public services. It embodies values such as excellence, integrity, and efficiency, reinforcing a commitment to delivering top-tier services that meet international standards. Through independent surveys, skill-building initiatives, and continuous promotion of best practices, SERVICOM positions itself as a pivotal entity in Nigeria's drive for public service quality enhancement.
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3.7 Process Requirements

Process requirements outline the specific criteria that a given process must adhere to, ensuring its smooth operation, consistency, and delivery of the intended results. These requirements are rooted in a systematic approach where interrelated or interacting activities utilize inputs to achieve a certain output, which could be a product, service, or another process. Understanding the intricacies of these requirements entails recognizing various types of processes and the diverse nature of their functionalities within an organization or a system.

The foregoing explanations, derived from the ISO 9000 document of fundamentals and vocabulary, clearly show without a doubt that process requirements are embedded and integral parts of all other quality requirements described earlier, be they standards, statutory and regulatory, organizational, product, or service. They all go through processes for their requirements to be developed, established, administered, or implemented. That is why process requirements are even more crucial than the others.

3.7.1 Types of Processes

1. **Operational Processes:** These are the core processes that directly relate to the primary mission of an organization:
    - *Production processes* are systematic activities that result in the manufacturing or development of goods.

- *Service delivery processes*: Procedures related to providing services to customers or stakeholders

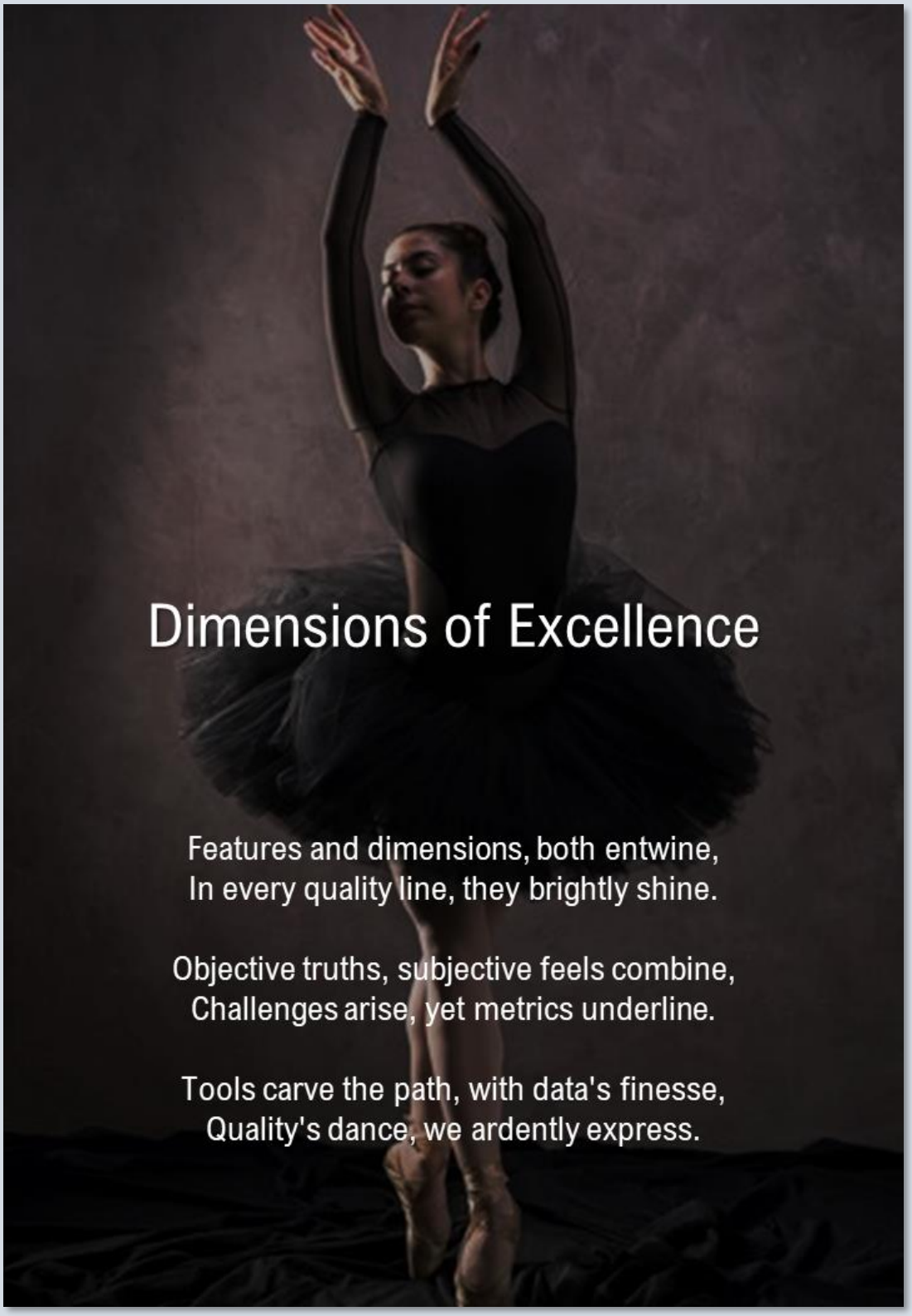
2. **Management Processes:** Higher-level processes that guide the operation of the organization:
    - *Strategic planning*: Defining the organizational direction and decision-making.
    - *Performance reviews*: Evaluating and ensuring that operational activities meet set standards
3. **Support Processes:** Although not core, these processes are essential for effective functioning:
    - *Administrative processes:* Activities like documentation, payroll, hiring, and other HR-related tasks.
    - *Infrastructure management:* Processes related to facility management, IT support, etc.
4. **Special Processes:** As per ISO 9000, these are processes where the conformity of the resulting output cannot be readily or economically validated.

3.7.2 Features of process requirements

1. **Clarity of Input and Output:** Every process should have clear inputs, sources, and expected outputs. An input for one process often becomes an output for another, creating a chain of processes.

2. **Interrelation and Interaction:** Processes rarely operate in isolation. They are often intertwined, and their activities must be coordinated to ensure smooth operation.
3. **Controlled Conditions:** Processes are typically planned and executed under controlled conditions to ensure efficiency, consistency, and the desired value addition.
4. **Conformity and Validation:** The end result of a process should conform to the intended specifications. If it does not, the process should have mechanisms for validation, especially if it is a special process where output validation is not straightforward.
5. **Efficiency and Efficacy:** A process should not only produce the desired result but should do so in the most efficient manner, optimizing resources and time.
6. **Adaptability:** Given the dynamic nature of business and technology, processes should be flexible enough to adapt to changes without compromising on quality.

Finally, while quality, by its nature, is viewed through diverse lenses, ISO's emphasis on "requirement" acts as a linchpin, uniting these varied perspectives. By focusing on what is required—whether by standard, statutory/regulatory, customer, service, product, or process—the definition transcends specific contexts and offers a universally applicable understanding. In sum, quality is not just about excellence or superiority but what makes it so; i.e., about meeting set requirements and aligning ***everything*** under one cohesive definition!


Dimensions of Excellence
Features and dimensions, both entwine,
In every quality line, they brightly shine.
Objective truths, subjective feels combine,
Challenges arise, yet metrics underline.
Tools carve the path, with data's finesse,
Quality's dance, we ardently express.

4 Dimensions For Measuring Quality

Obviously, quality can be measured. The ISO definition also makes it clear that quality is "*the degree to which...*" In this chapter, we want to understand the dimensions that have afforded us the possibility of measuring and obtaining the *degree* with ease. However, before we proceed deeper, let us squarely differentiate between the features and dimensions of quality. These words have also been used interchangeably, so confusion may arise.

4.1 Features vs. Dimensions of Quality

Features of quality refer to the inherent characteristics or attributes of a product, service, or process that make it meet or exceed expectations. They are the fundamental aspects that define and ensure quality. Features can be thought of as the tangible or intangible attributes that a product or service should possess to be considered of high quality. They are often measurable and can be directly related to standards, specifications, or customer requirements. For example, a mobile phone's battery life can be a feature of its quality. Another example is the clarity of communication in a call center might be a feature of the quality of service.

According to David A. Garvin and other quality experts, dimensions of quality are particular viewpoints or angles from which to assess the quality of a good or service. They provide a comprehensive framework to assess quality across

various parameters. Each dimension is a lens through which one can analyze and measure quality. For example, the aesthetic appeal of a product falls under the "aesthetics" dimension. Another example is the ease with which a product can be repaired relates to the "serviceability" dimension.

In summary, while both features and dimensions are crucial to understanding and ensuring quality, features are the inherent attributes of a product, service, or process, whereas dimensions offer specific perspectives or criteria to evaluate those attributes. **Box 4** below presents some key elements to further differentiate between features and dimensions of quality.

S/N	Elements	Features	Dimensions
1.	**Breadth vs. Depth**	Broad aspects that encompass quality	Deeper into specific facets of those features
2.	**General vs. Specific**	Tends to be more general characteristics shared across products, services, or processes	Offer specific perspectives or angles from which quality can be evaluated
3.	**Existence vs. Evaluation**	Inherent attributes that exist in a product or service or process	Criteria or perspectives used to evaluate and measure those features

Box 4 Differences between features and dimensions of quality

4.2 Dimensions of Quality

To understand and enhance the overall value of products, services, or processes, it is essential to delve deep into the diverse dimensions of quality. These aspects of quality are intrinsic indicators that help stakeholders ensure that a deliverable not only meets but surpasses the predefined requirements.

4.2.1 Design

The quality of design captures the planned characteristics and attributes of a product or service. Rooted in customer needs and expectations, this dimension involves considerations like functionality, durability, reliability, aesthetics, and usability. Through a methodical approach encompassing rigorous testing, prototyping, and material selection, quality of design strives to offer products or services that not only fulfill but exceed customer expectations, giving providers a distinctive edge in the market.

4.2.2 Conformance

Ensuring that the actual output aligns seamlessly with the envisioned design is the primary aim of quality conformance. Focusing on execution, this quality aspect emphasizes adherence to predefined standards, specifications, and procedures. By employing techniques such as quality control, regular inspections, process enhancements, and staff training, this dimension ensures minimal deviations, paving the way for a flawless end product or service.

4.2.3 Performance

This aspect dives into the functional realm, analyzing how a product or service performs its intended function. Whether it is the endurance and speed of a product or the accuracy and timeliness of a service, the quality of performance offers insights into the practical efficacy of a deliverable. Stellar performance quality often translates into increased customer loyalty, repeated patronage, and a robust, positive reputation.

4.2.4 Experience

The quality of experience encompasses the complete journey of a customer with a product, service, or brand. This holistic dimension transcends basic functionality or performance, embracing elements like emotions, perceptions, and preferences. Factors shaping this experience range from user-friendly product features to post-sales support. In today's fiercely competitive scenario, delivering an unparalleled quality of experience can significantly differentiate a brand, compelling customers to become loyal ambassadors.

4.3 Subjective and Objective Nature of Quality

It is important to mention the subjective and objective components of the dimensions for measuring quality. Both components can be measured and quantified, but the objective is easily measured with little or no biases because it is about meeting set specifications, adhering to standards, or achieving

performance metrics. For example, an electronic device functioning without failure for a certain period, a service provided within the promised timeframe, or a product manufactured to exact specifications all represent the objective dimensions of quality. However, the subjective dimension of quality, on the other hand, is based on personal perceptions and experiences. It is about how a product, service, or process meets or exceeds individual expectations and the value the customer perceives. This might include how a customer feels when walking into a store, the aesthetic appeal of a product, or the perceived taste of a particular food item.

Understanding both components of quality dimension is crucial. While objective quality commonly forms the foundation of a product or service, it is subjective quality that often differentiates and creates value in the eyes of the customer. Striking the right balance between both is the key to true quality excellence.

4.4 Measuring Quality

The measurement of quality is a fundamental aspect of quality management. Although the scope of this book does not delve into quality management, we shall try to explore the surface, enabling us to have a substantial understanding of the fundamentals of quality.

It is through monitoring and measurement that organizations can understand the current level (or *degree*) of quality, identify areas for improvement, and monitor the effectiveness of quality improvement initiatives.

4.4.1 The challenges of measuring quality

Measuring quality is inherently complex and can be challenging for several reasons:

1. **Subjectivity**: As mentioned earlier, quality dimension is often subjective due to human involvement. For example, what one person considers high quality in a product may be mediocre to another. This subjectivity makes it difficult to have a single standard measure that applies universally.
2. **Diverse Dimensions:** As quality can encompass different dimensions (e.g., performance, reliability, aesthetics), measuring it means considering multiple dimensions, which may not always be easy to quantify.
3. **Dynamic Nature**: Even quality standards and customer expectations change over time. What is considered high quality today may not be seen the same way in the future.
4. **Intangibles:** Especially in services, some quality elements, like customer satisfaction, are intangible and harder to measure compared to tangible attributes.

4.4.2 Quality metrics and indicators

Despite the challenges, different organizations apply different metrics and indicators. Some of the metrics and indicators that organizations use to measure the different dimensions of quality include:

1. **Customer Satisfaction or Dissatisfaction:** Surveys, feedback forms, complaints platforms and reviews are often used to gauge customer satisfaction or dissatisfaction, which is a key indicator of quality.
2. **Defect Rates:** In product manufacturing, the number of defects per unit or batch is a direct measure of quality. Lower defect rates typically indicate higher quality.
3. **Return Rates:** The rate at which customers return a product can be indicative of its quality. High return rates might suggest quality issues.
4. **Process Capability Indices:** These are used in manufacturing to measure how well a process is meeting specification limits.
5. **Time-Based Metrics:** Time to resolve issues, lead time, and other time-based metrics can be crucial indicators of quality, especially in service industries.

4.4.3 Tools for quality measurement

Each quality metric or indicator is measured using an appropriate tool. Just like you cannot measure height with a weighing scale, you cannot measure weight with a meter tape. Various tools can be employed by an organization to measure quality based on its quality goals, product, service, or process:

1. **Surveys and Questionnaires:** These tools are especially useful in capturing customer perceptions of quality.

2. **Control Charts:** Used to monitor the stability and performance of a process over time, and to identify variations that may indicate quality problems.
3. **Check Sheets:** Simple tools for collecting and analyzing data. They are custom-designed forms that allow employees to record data in a structured manner.
4. **Pareto Analysis:** A technique used to identify the most common sources of defects, the most frequent causes of customer complaints, or any other factor that measures the non-conformance to a quality standard.
5. **Six Sigma Tools:** These include a variety of tools like DMAIC (Define, Measure, Analyze, Improve, Control) and root cause analysis that focus on improving quality by reducing variations and defects.

4.4.4 Data for quality measurement

In the realm of quality measurement, data stands as the backbone, providing the vital information against which quality is gauged. After all, metrics, indicators, and tools are of little use without accurate, relevant, and timely data to analyze.

1. **Relevance:** The data collected should pertain directly to the quality dimension being evaluated. For instance, if one wishes to assess the quality of a call center's service, data on call durations, customer feedback, and resolution rates would be relevant.

2. **Accuracy:** It is imperative that the data be accurate. Misleading or incorrect data can result in misguided decisions, potentially compromising quality further. In manufacturing, for example, inaccurate data regarding defect rates can lead to overlooked issues or wasted resources in addressing non-existent problems.
3. **Timeliness:** Data should be timely, reflecting current conditions or trends. Outdated data can result in actions that are misaligned with present needs. Consider the dynamic nature of customer preferences; relying on older data might lead to products that no longer align with market desires.
4. **Completeness:** Incomplete data can provide a skewed perspective on quality. It is essential to ensure that the data captures all relevant aspects of the quality dimension being evaluated. For instance, if only positive reviews are considered without taking negative feedback into account, an overly optimistic view of quality might be formed.
5. **Consistency:** Given the dynamic nature of quality and its standards, data consistency becomes crucial. It is vital to ensure that data is collected and measured in consistent ways over time, facilitating meaningful comparisons and trend analysis.

In conclusion, while tools are essential for capturing and analyzing quality, it is the data that feeds these tools, ensuring a comprehensive understanding of quality's multi-faceted dimensions. Proper data collection and analysis are pivotal in steering quality improvement initiatives in the right direction.

Quality's Tapestry

Quality and society, deeply align,
In every endeavor, their ties intertwine.

Values shared, aspirations intertwined,
From every corner, their essence we mine.

Standards uplift, as cultures progress,
In society's fabric, quality we impress.

5 Quality and Society

Society, in its intricate tapestry, comprises individuals, cultures, institutions, economies, and communication channels, each functioning within a broader environmental context. At the core of these multifaceted interactions lies the principle of quality. It is not merely a measure of excellence but an essential force guiding the evolution of societies. Quality ensures that individuals coexist harmoniously, cultural and moral foundations remain robust, institutions function with integrity, and economic and technological systems progress sustainably. This chapter offers a comprehensive exploration of the symbiotic relationship between quality and society, emphasizing their mutual influence and the ensuing implications for a harmonious future.

5.1 Individual and Collective Dynamics

At its most fundamental level, society is composed of individuals. When these individuals interact, communicate, and form relationships, they create social groups. These can be families, tribes, communities, or other collective entities. However, as groups develop social norms and values, the rules and standards that dictate behavior within a society emerge. They are what is considered 'normal' or 'acceptable' within a group, and they play a pivotal role in shaping individual behavior as well as the social stratification that evolves. Most societies have systems or structures of categorization where individuals or groups are ranked above or below others, often based on factors like wealth, power,

education, or job roles. This often leads to social classes. Thus, establishing and adhering to requirements for harmonious co-existence ultimately defines the individuals and the collective dynamics.

Quality, in the context of individual and collective dynamics, is inherently about understanding and catering to the evolving needs and aspirations of individuals while ensuring the cohesive functioning of the larger group. This requires:

1. **Inclusivity and Diversity:** Recognizing and valuing the diverse backgrounds, perspectives, and contributions of all members. This inclusivity fosters a sense of belonging and mutual respect among individuals, enhancing the quality of interactions.
2. **Clear Communication Channels:** Establishing open, transparent, and accessible means of communication. This ensures that individuals are well-informed, feel heard, and can actively participate in collective decision-making.
3. **Conflict Resolution Mechanisms:** Given the diverse nature of individuals, conflicts are inevitable. Quality in managing collective dynamics requires robust mechanisms to address, resolve, and learn from conflicts, ensuring harmony and mutual respect.
4. **Social Mobility Systems:** Societies must have equitable opportunities for growth and development, allowing individuals to move across social strata based on merit and effort rather than predetermined factors like birth or tribe. This ensures a fairer distribution of resources and opportunities, enhancing the overall quality of life.

5. **Ethical Frameworks:** Societies should have ethical standards that emphasize fairness, empathy, and respect for all. These ethics serve as a foundation for decision-making and behavior, ensuring that the collective acts in the best interests of its constituents.

The fluidity of social dynamics requires that societies continually reassess and refine their norms and structures. By integrating quality measures into the very fabric of these dynamics, societies can ensure they are resilient, adaptive, and, most importantly, conducive to the well-being and fulfillment of every individual within the collective.

5.2 Cultural and Moral Foundations

Cultural and moral foundations serve as the bedrock upon which societies are built. These ingrained aspects guide individual behavior, collective actions, and societal expectations. Quality, in this context, does not necessarily denote a standard of 'good' or 'bad', but rather a depth of richness, authenticity, and consistency that ensures the culture's preservation, appreciation, and evolution.

1. **Culture:** Every society's tapestry of beliefs, traditions, customs, and behaviors gives it a unique identity. The quality of a culture can be observed in its authenticity, the way it is revered and upheld by its members, and how it adapts over time. For a culture to maintain its quality:

   a. The preservation of historical and traditional practices, artifacts, and monuments becomes paramount.
   b. Education and awareness campaigns should be promoted to ensure younger generations understand, appreciate, and carry forward their cultural heritage.
   c. Adaptation and integration of new elements should be done sensitively, ensuring the core essence of the culture remains intact.
2. **Arts and Tools:** The manifestation of culture through various arts, tools, and mediums is a testament to its dynamism and vibrancy. Quality here is reflected in originality, craftsmanship, and the representation of cultural essence.
   a. Institutions like museums, theaters, and galleries play a pivotal role in preserving and showcasing the pinnacle of a culture's artistic achievements.
   b. Training and development of artists, craftsmen, and curators ensure that the quality of representation remains high and is passed on to subsequent generations.
3. **Religion and Belief Systems:** These spiritual anchors provide moral, ethical, and existential guidance. The quality of this domain is gauged by the depth of understanding, the clarity of teachings, and the inclusive nature of practices.
   a. Houses of worship and spiritual leaders must emphasize core teachings that promote peace, love, and unity.

b. Interfaith dialogues and platforms should be encouraged to foster understanding and respect among different belief systems.
c. In a rapidly changing world, spiritual teachings need to be contextualized, ensuring they remain relevant while upholding their core essence.

For a society to thrive and ensure the well-being of its members, its cultural and moral foundations need to be robust and dynamic. By weaving quality standards into these foundations, societies not only ensure the preservation of their rich heritage but also create an environment conducive to mutual respect, understanding, and harmonious co-existence.

5.3 Institutional Structures

Institutions serve as the backbone of any society, providing the framework through which its various functions are managed, coordinated, and governed. These organized structures not only ensure the smooth operation of societal segments but also play an influential role in determining the overall quality of life for their members. As such, the quality of these institutions and their adherence to particular standards can significantly affect the outcomes they produce for society.

1. **Educational Institutions:** Schools, colleges, and universities are vital for the intellectual and moral development of individuals. The quality of education determines the future workforce's skill set, adaptability, and

innovation. Key requirements here include updated curricula, qualified educators, facilities conducive to learning, and access to resources. Continuous improvement through feedback mechanisms and research-driven approaches ensures that educational systems meet global standards and societal needs.

2. **Legal Institutions:** The judiciary and its associated bodies uphold justice and maintain societal order. Quality in this context means fairness, transparency, timely resolution of cases, and accessibility to all citizens. Legal institutions must ensure that laws are applied consistently and that citizens have faith in the justice system's impartiality.
3. **Political Institutions:** Governments, political parties, and associated entities drive a society's direction and governance. Their effectiveness and integrity determine societal stability and progress. For these institutions to serve with quality, there is a need for transparency, accountability, efficient public service delivery, and active citizen participation. This ensures that decisions made align with the broader public interest and that the governance mechanisms remain responsive and adaptive.
4. **Religious Institutions:** Serving as moral compasses, religious institutions influence personal values, societal norms, and community cohesion. Quality requirements here revolve around inclusivity, respect for diversity, promoting peace, and acting as platforms for community support and growth.
5. **Financial Institutions:** Banks, credit unions, and other financial bodies are pivotal for economic stability and growth. They must adhere to

rigorous standards of transparency, accountability, and risk management. Their quality assurance ensures trust in the economic system, fostering investments, savings, and overall economic health.

Across all these institutions, a continuous commitment to quality involves regular evaluations, adherence to international best practices, training, and capacity-building. By integrating quality into institutional structures, societies can achieve sustainable development, promote equitable opportunities, and ensure that the collective needs and aspirations of their members are adequately addressed.

5.4 Economic and Technological Systems

The economic vitality and technological prowess of a society form the backbone of its progress and sustenance. Ensuring quality within these domains not only drives efficiency and innovation but also plays a pivotal role in enhancing the overall quality of life for its citizens.

1. **Economy:** A quality-centric economy is one where goods and services are produced efficiently, distributed equitably, and consumed responsibly. To ensure and maintain economic quality:
    a. Regulatory mechanisms must ensure ethical practices, fair competition, and the prevention of monopolistic tendencies.

b. Investment in research and development encourages innovation, fostering an environment where quality products and services can thrive.
c. A transparent and inclusive financial system ensures that all segments of society have access to resources, reducing economic disparity.
d. Continuous assessment of market demands and consumer feedback can guide production, ensuring that goods and services align with societal needs and preferences.

2. **Technological Advancements:** Technology, in essence, is a tool to improve the human experience, and the quality of these tools determines the efficiency and effectiveness of this improvement. Therefore, for a society to harness the full potential of technology:
    a. Education and training programs should be in place to ensure that the population can adeptly use and adapt to new technologies.
    b. Stringent quality control and testing measures must be implemented to guarantee that technologies are reliable, durable, and safe.
    c. Ethical considerations should always be at the forefront when developing or adopting new technologies, ensuring that they benefit society as a whole and do not disproportionately disadvantage any segment.

d. Feedback loops, where users can relay their experiences and issues, can drive technological refinements, ensuring that tools and systems are continuously improved.

Furthermore, the interconnectedness of economic and technological systems cannot be understated. An economy bolstered by cutting-edge technology has the potential to be more adaptable and resilient, while advancements in technology can unlock new economic opportunities. However, the pursuit of progress in both domains should always be grounded in the principles of sustainability, ethics, and inclusivity. By integrating quality into the fabric of economic and technological systems, societies can ensure that they are paving the way for a prosperous, balanced, and forward-looking future.

5.5 Communication and Interactions

In an interconnected world, the means and quality of communication form the backbone of any thriving society. Communication systems have evolved over the years, spanning from traditional means like newspapers, television, and radio to the contemporary digital realms of social media platforms, online news portals, and instant messaging. The effectiveness, accuracy, and reliability of these communication channels are imperative for the dissemination of information, fostering understanding, and cultivating relationships within and outside a society.

Quality in communication is not just about clarity; it encompasses:

1. **Accuracy:** Ensuring that the information disseminated is correct and devoid of misinformation.
2. **Timeliness:** The speed at which information is shared can make a significant difference, especially in situations demanding immediate attention.
3. **Accessibility:** Ensuring that all segments of society, regardless of their socioeconomic status or physical abilities, have access to vital information.
4. **Relevance:** Sharing information that resonates with the target audience and meets their needs.
5. **Security:** In the digital age, the protection of communication systems and the information they transmit from cyber threats becomes paramount.

Additionally, a society's interactions with its global counterparts are critical in shaping its evolution, progress, and cultural dynamics. No society can truly exist in isolation. The intricate web of trade, diplomacy, cultural exchanges, migration, and even conflicts like wars leaves indelible marks on the character and development of a society. In these interactions, quality plays a vital role:

1. **Trade:** Ensuring the quality of goods and services exchanged fosters trust and long-term trade relationships.
2. **Diplomacy:** Effective, transparent, and quality-driven diplomatic communications can lead to peace treaties, alliances, and international collaborations.

3. **Cultural Exchange:** The exchange of cultural artifacts, performances, or traditions must uphold the authentic quality of the original to maintain respect and understanding.
4. **Migration:** Ensuring quality in migration processes, from vetting to integration support, ensures smooth transitions for individuals and societies alike.

In essence, the quality of communication and interactions, both internal and external, influences a society's reputation, effectiveness, and stability. It is not just about meeting set requirements; it is about exceeding them to foster connections, mutual respect, and growth.

5.6 Environmental Interactions and Sustainability

The relationship between a society and its environment is a symbiotic one, marked by a delicate balance. The geography and environment in which a society thrives not only shape its agriculture, economy, and cultural shades but also fundamentally influence its approach to sustainability and quality.

Interactions with the environment often dictate a society's survival strategies. Choices, whether to conserve resources, maintain harmony, or, unfortunately, indulge in pollution, have lasting repercussions on a society's long-term viability. Amidst this backdrop, the principles of quality emerge as pivotal tools in ensuring sustainable coexistence. High-quality products and practices do not just signify superior craftsmanship or service; they embody a commitment to

longevity and efficiency. A well-made product reduces waste and the need for frequent replacements, thus conserving resources. Quality management, on the other hand, optimizes operations, ensuring minimal waste and diminished pollution.

Bridging the gap between quality and sustainability is the innovative concept of "sustainable quality." Championed by forward-thinking organizations, this approach fuses quality's commitment to excellence with a deep-seated dedication to environmental stewardship and societal responsibility. The result is a holistic model where quality does not just enhance economic growth but also bolsters environmental health and nurtures social equity. In essence, sustainable quality is not just a strategy; it is a vision for a harmonious future.


Management Melody
In quality management, policy foundations lay,
Guiding objectives and ventures, night and day.
From assurance's embrace to control's keen eye,
Improvement's relentless, reaching the sky.
Every note struck, with purpose so grand,
In quality's symphony, we take a stand.

6 Quality Management

By now, it is clear that quality does not just happen by accident but requires effective management. According to ISO 9000, the process of managing quality encompasses setting quality policies and objectives, then devising strategies through quality planning, assurance, control, and improvement to realize these objectives. Every entity, regardless of its nature, can and should manage its quality, given its profound benefits and influence on societal well-being. In this chapter, we will just gloss over these components of quality management because QIIN has dedicated books on them, but we will also touch upon the consequences of neglecting this crucial aspect and its overall impact on the quality of life.

6.1 Components of Quality Management

6.1.1 Quality policy and planning

The quality policy is the foundation upon which all quality-related activities rest. It articulates the intentions and direction related to quality as laid out by drivers or directors of organizations. Typically, a policy is in alignment with the organization's broader vision and mission. This policy not only sets the tone but also provides the framework within which quality objectives are established. The quality management principles enshrined in ISO 9001 can serve as the

foundation for crafting this policy. Box 5 below provides an example of quality policy established by a hospital that is certified to ISO 9001: 2015.

QUALITY POLICY STATEMENT

DIFF Medical Centre (DMC) is committed to passionately render excellent clinical services in a private healthcare system, within a responsibly adaptive setting and progressively advancing the established Quality Management System ISO 9001:2015; with the aim to inspire patients' confidence and optimize their satisfaction using objective parameters within the boundaries of statutory and regulatory requirements.

Box 5: Quality Policy of DMC, Abuja Nigeria
(Source: https://diffmedicalcentre.org/about/)

Connected with the establishment of quality policy, which can also be regarded as the beginning of quality planning, the process of planning is dedicated to charting the roadmap for quality. It involves laying down quality objectives and identifying the necessary operational processes, along with the required resources, to attain these objectives. Essentially, quality planning ensures that there is a clear path toward achieving the desired level of quality.

6.1.2 Quality objectives

These are specific goals related to quality. Grounded in the organization's quality policy, these objectives are usually tailored for various roles, echelons, and activities within the organization. They act as measurable targets, guiding every quality endeavor towards desired outcomes. However, to ensure that these objectives are practical, effective, and yield tangible results, they should be crafted following the SMART (Specific, Measurable, Achievable, Relevant, Time-bound) framework:

1. **Specific:** Quality objectives should be clear and unambiguous. Instead of broad goals like "improve product quality," a specific objective might be "reduce manufacturing defects by 15%."
2. **Measurable:** Every objective needs a metric. Without quantifiable data, it becomes challenging to gauge progress. For instance, "increase customer satisfaction" becomes measurable when framed as "achieve a 90% customer satisfaction score in post-service surveys."
3. **Achievable:** While ambition is commendable, objectives should be realistic. They should challenge the organization but remain within the realm of possibility, considering resources, constraints, and external factors.
4. **Relevant:** The objectives should align with the organization's mission, vision, and quality policy. They must be pertinent to the business goals and resonate with the broader organizational strategy. For example, freshness is core to a bakery's value proposition. By aligning the objective

with ensuring the best possible product for the customer, this resonates with a bakery's mission to deliver high-quality baked goods. This also supports the bakery's vision of being recognized for outstanding product quality in the community.

5. **Time-bound:** Setting a clear timeframe ensures momentum and focus. Whether it is a short-term goal like "reduce order processing errors by 5% in the next quarter" or a long-term one spanning years, a deadline creates a sense of urgency and purpose.

Incorporating the SMART framework into the formulation of quality objectives ensures they are well-defined and actionable. Such objectives not only provide a clear direction but also enable organizations to monitor progress, make necessary adjustments, and celebrate successes.

6.1.3 Quality assurance (QA)

Serving as a confidence builder, quality assurance focuses on ensuring that the set quality requirements will be consistently met. This aspect of quality management is all about providing stakeholders with the assurance that quality benchmarks will be adhered to, building trust and reliability. Its significance is derived from the dual confidence it provides, both within and outside of an organization.

1. **Internal Confidence for Management:** For example, before launching a new software application, an in-house QA team conducts extensive testing.

By uncovering and rectifying bugs, the team assures management that the software is robust and ready for market release. This internal validation aids in decision-making and guarantees that the product aligns with organizational standards. QA also include the establishment of standard operating procedures (SOPs), such as for the uncovering and rectifying bugs.

2. **External Confidence for Stakeholders:**
    a. *Customers:* By consistently delivering high-quality products that meet or exceed expectations, businesses assure customers of their reliability. For instance, a car manufacturer that undergoes rigorous quality assurance tests assures customers of vehicle safety and reliability.
    b. *Government Agencies and Regulators:* Industries, especially those that affect public safety or health, often need to adhere to strict governmental standards. A pharmaceutical company, through its QA processes, ensures drug efficacy and safety, providing confidence to health agencies.
    c. *Certifiers:* Certification bodies look for consistent quality adherence. For example, a food processing company may receive an ISO 22000 certification, assuring stakeholders of its commitment to food safety.
    d. *Third Parties:* Suppliers and partners also seek assurance of quality. A B2B tech provider, for example, would assure its business clients that its systems are secure and efficient through its QA protocols.

In essence, quality assurance is not just a procedural requirement. It is a strategic tool that assures stakeholders, both internal and external, of the organization's commitment to excellence, thereby building trust, credibility, and lasting relationships.

6.1.4 Quality control (QC)

This component emphasizes the actual fulfillment of quality requirements. It is the hands-on approach or practical aspect of quality management, where checks and measures are put in place to identify and rectify deviations and ensure that the end product or service meets or exceeds the defined quality criteria (requirements).

1. **Standardized Testing**: For example, in textile manufacturing, QC teams might regularly inspect fabric batches for defects like color inconsistency or weaving flaws. Such systematic checks ensure that only defect-free fabrics reach the next production phase or the end consumer.
2. **Product Inspections:** *Customers*: Before a product hits the shelves, it undergoes rigorous QC inspections to ensure it meets design specifications. For instance, in electronics manufacturing, each smartphone might undergo a series of tests, from touchscreen responsiveness to battery life, to ensure consumers receive a faultless device.
3. **Process Monitoring:** *Operators:* In industries like food and beverage, real-time process monitoring is crucial. Automated sensors might monitor

temperature and pH levels during beverage bottling. Any deviation triggers alerts, enabling swift corrective actions and ensuring the drink's taste and safety.

4. **Sampling and Analysis:** *Certifiers:* To maintain certifications or seals of approval, organizations often use QC sampling. For example, an organic food producer might periodically send product samples for laboratory analysis, ensuring no prohibited chemicals or additives are present and retaining organic certification.
5. **Feedback Loops:** *Third Parties:* By gathering feedback from retailers or distributors on product quality, businesses can quickly detect and address recurring issues. A cosmetic brand, for instance, might adjust its lipstick formula based on retailer feedback about melting issues in specific climates.

6.1.5 Quality Improvement

Going beyond mere adherence to standards, quality improvement is the proactive pursuit of excellence; it is about elevating the capability to meet and surpass quality requirements. This continuous process looks at aspects like efficiency, effectiveness, and traceability, striving to uplift every dimension of quality over time. Monitoring, measuring, and evaluating quality that are embedded in the Plan-Do-Check-Act Cycle (PDCA) of these and other aspects, dimensions, or objectives are the basis of quality improvement.

1. **Process Refinement:** *Efficiency*: In automobile manufacturing, for example, QI might involve refining the assembly line process to reduce production time per vehicle without compromising the car's quality.
2. **Feedback Utilization:** *Effectiveness*: For example, in the service industry, a hotel might initiate a guest feedback system. Negative feedback about room service speeds can trigger streamlined processes or additional training for staff, ensuring faster and more efficient service on the next visit.
3. **Technology Integration:** *Traceability*: In pharmaceuticals, for example, the incorporation of advanced tracking systems can ensure that every medicine's origin, production date, and batch number can be traced back to its source. This not only aids in quality assurance but also in cases of recalls, ensuring patient safety.
4. **Innovative Solutions:** *Problem-solving:* A software company, upon detecting a recurrent software bug, might not just fix it but also invest in research to improve the underlying code structure, ensuring the issue does not re-emerge in future iterations.
5. **Training and Development:** *Capability Building*: In the healthcare sector, for example, continuous medical training for practitioners on emerging diseases, treatments, or medical technologies ensures that patient care quality is consistently enhanced.

Fundamentally, quality improvement is the heart of progressive evolution, urging organizations to look forward, anticipate challenges, and innovate

solutions. It is about ensuring that the journey of quality does not have a finish line but is a relentless pursuit of excellence.

6.2 Quality Management System Certification: Beyond the Myths

We want to encourage organizations to find the right support in adopting and adapting the renowned ISO 9001:2015 standard in their operations, as it would immensely help in managing quality effectively. While the allure of certification holds strong, the essence lies in the foundational principles and practices underpinning the standard. Here, we demystify the true potential of adopting the ISO 9001:2015 framework, even without the emblem of certification.

6.2.1 Understanding the core of ISO 9001:2015

ISO 9001:2015, at its heart, is not merely a certification. It is a strategic tool designed to bolster an organization's performance and lay the groundwork for sustainable growth. Some of its pivotal benefits include:

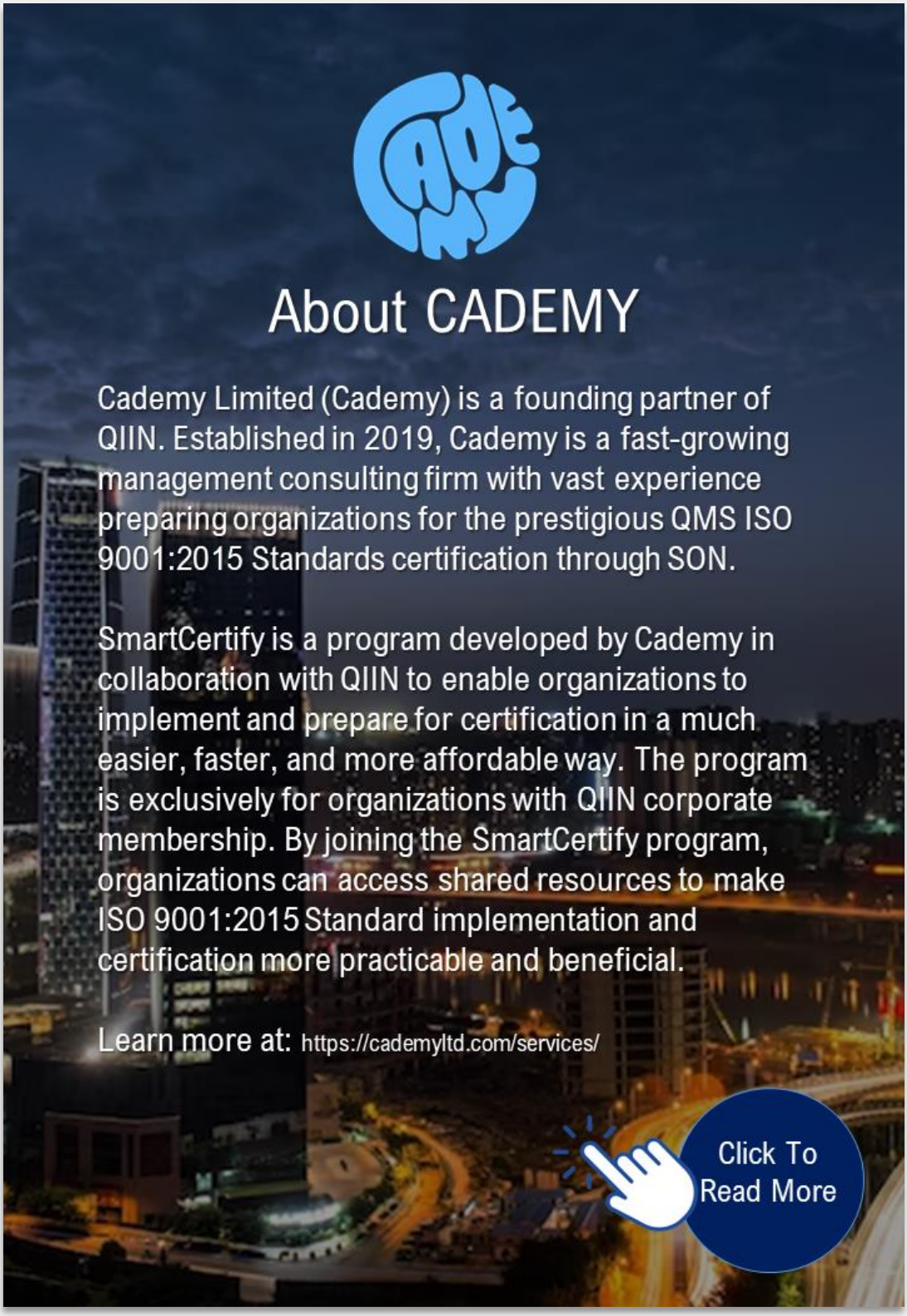
a. Ensuring a consistent delivery of high-quality products and services that align with customer expectations and statutory and regulatory obligations.
b. Enhancing opportunities to increase customer satisfaction.
c. Recognizing and addressing the various risks and opportunities relevant to an organization's context and ambitions
d. Providing a platform to validate adherence to prescribed QMS requirements

The standard's holistic approach revolves around the Plan-Do-Check-Act (PDCA) cycle, intertwined with risk-based thinking, process approach and more. This not only facilitates organizations to meticulously designed processes but also ensures they are adeptly managed, resourced, and continually improved.

Moreover, it is crucial to acknowledge that the standard does not dictate uniformity in QMS structures or mandate the alignment of documentation to its clause structure. Nor does it insist on adopting its specific terminologies within an organization. Its main essence is to complement the requirements of products and services delivered by any organization while championing a process-oriented approach.

6.2.2 ISO 9001:2015: Certification vs. Application

It is a misconception that the true value of ISO 9001:2015 lies solely in its certification. Organizations can harness the profound insights and frameworks of the standard to refine their products, services, and processes, irrespective of whether they acquire formal certification. This standard, being versatile, caters to both internal and external stakeholders, guiding them towards operational excellence. Organizations seeking to elevate their quality management should not view ISO 9001:2015 merely as a badge of honor. Its true essence lies in its frameworks, methodologies, and principles. Whether an organization chooses to get certified or simply adopts its practices, the ultimate goal remains consistent: achieving excellence, driving customer satisfaction, and ensuring sustainable growth.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6.3 The Cost of Quality and the Cost of Poor Quality

Cost of Quality (COQ) and Cost of Poor Quality (COPQ) are essential metrics that provide insight into the economic implications of producing quality and non-quality products or services. By understanding these costs, organizations can optimize resources, prioritize improvements, and steer towards a culture of continuous quality enhancement. Let us try to understand these essentials:

6.3.1 Cost of Quality (COQ)

COQ encapsulates the resources employed to ensure good quality. It is the summation of the costs associated with good-quality production and the costs associated with poor-quality production.

The COQ is systematically categorized into:

1. **Prevention Cost:** Expenditures aimed at ensuring the prevention of defects Examples include quality planning, training, market research, and supplier evaluations.
2. **Appraisal Cost:** Costs related to the assessment and verification of product or service quality This includes activities like inspections, laboratory testing, and supplier evaluations.
3. **Internal Failure Cost:** Expenses stemming from defects detected before reaching the customer, such as rework, scrap, and repair.

4. **External Failure Cost:** Costs incurred when defects are identified after the product reaches the customer, e.g., warranty claims, customer visits, replacements, and potential loss of goodwill.

COQ is not just a metric; it is a philosophy. It demands alignment with the organization's broader objectives and serves as a compass guiding effective resource allocation. A well-established COQ system should become dynamic, adapting to changes and positively influencing the achievement of organizational goals. The renowned quality expert Philip Crosby emphasized that the costs associated with nonconformance are choice organizations make, which can be weighty. For many, this can be as high as 15-20% of sales revenue, with some even reaching 40% of total operations. However, with effective quality improvement measures, these costs can be substantially reduced, thereby directly boosting profits.

6.3.2 Cost of Poor Quality (COPQ)

COPQ reflects the costs incurred due to errors and the production of subpar goods or services. It signifies the economic losses an organization faces because of deficiencies. COPQ is a critical metric as it:

a. Helps in resource optimization by identifying system waste.
b. Highlights how profit margins are influenced by quality.
c. Translates quality metrics into a language that resonates with management.

d. Encourages a culture of continuous improvement by spotlighting areas needing enhancement.

COPQ is an invaluable tool for organizations striving for operational excellence. By understanding and analyzing COPQ, organizations can:

a. Define clear, quality goals and objectives.
b. Evaluate existing systems and machinery capabilities.
c. Validate quality costs with the finance team.
d. Focus on preventative measures instead of rectifications, thereby ensuring efficient use of resources.
e. Streamline quality processes, leading to substantial financial savings.

Overlooking or undermining COPQ can have severe repercussions, including:

a. Financial setbacks.
b. Delays in schedules.
c. Excessive resource allocation for checks and controls.
d. Demotivation among staff
e. Tarnished organizational reputation.
f. Loss of competitive edge

Finally, understanding and leveraging the principles of COPQ and COQ are paramount. Organizations that effectively manage these costs not only enhance their profitability but also foster a culture of continuous improvement, ensuring long-term sustainability and growth. As Warren Buffett wisely stated, "The most

important thing to do if you find yourself in a hole is to stop digging." This philosophy holds true in the realm of quality management: acknowledging and addressing costs associated with poor quality is the first step towards building a robust quality-driven organization.

6.4 Quality of Life and Its Societal Implications

Quality of life, a blend of one's physical well-being, mental state, personal independence, societal interactions, and environmental rapport, serves as a barometer for individual and collective contentment. Its subjective nature is influenced by diverse factors ranging from health and education to personal values and socio-economic status. However, in the broader context of society and quality management, this notion takes on deeper, more systemic meanings.

6.4.1 Role of product and service quality

A society's commitment to quality is prominently manifested in its products and services. The reliability of a well-crafted home appliance is not just about longevity; it is a statement on society's emphasis on stress-free living and efficiency. Likewise, top-notch services, be they in education, healthcare or transportation, not only reflect a society's capabilities but also its priorities. The prominence of high-caliber goods and services is often a testimony to a region's economic prowess and its stride towards social parity, both quintessential for a superior quality of life.

6.4.2 Governance, healthcare, education, and living spaces

As mentioned earlier, a society's heart beats in its institutions. Transparent, equitable, and efficient governance, rooted in quality management principles, underpins societal well-being. It ensures that resources are judiciously used, citizens' voices are heard, and their rights are safeguarded. Similarly, quality in healthcare is not confined to infrastructure or technology; it is a vow to safety, effectiveness, and patient dignity. When hospitals commit to quality management, the results transcend mere statistics: fewer infections, improved patient experiences, and lives genuinely saved.

Education, another cornerstone, mirrors a society's foresight. It is not just about vast curricula or digital classrooms; it is about nurturing environments, proficient educators, and resources that truly cater to learners' needs. Quality-driven education prepares individuals for societal roles, promoting both individual growth and societal cohesion. Finally, superior living conditions, reflecting quality housing, sanitation, and safety norms, form the bedrock of a population's physical and emotional health.

6.4.3 Collective ambition and accountability

Envisioning a superior quality of life is a collective pursuit. Governments, armed with policies, should continually strive to elevate education, healthcare, and living standards, ensuring a governance framework imbued with quality principles.

Conversely, the burden is not just on the public sector. Private organizations, for example, through their corporate social responsibility (CSR) ethos, can be instrumental change agents. By championing quality in their offerings, adopting sustainable measures, and propelling community growth initiatives, they reaffirm their role in societal progress.

In summary, quality of life, shaped by governance, healthcare, education, and environmental factors, remains a testament to societal evolution. When underpinned by conscientious quality management and societal commitment, it ensures that communities do not just thrive, but flourish.


Echoes of Future Quality
In tech's swift moves and societal tide,
Quality's essence won't simply reside.
Both function and heart, together they weave,
A future where human and AI achieve.
Challenges beckon, yet opportunities wide,
In disruptive future our hopes of quality confide.

7 Future Trends in Quality

In a rapidly evolving world driven by disruptive technologies and shifting societal expectations, the understanding of quality, its dimensions, and its management has undergone a profound transformation. Building upon the insights garnered from previous chapters, this chapter seeks to project into the future and discern the most defining trends that will shape the essence of quality.

7.1 The Fluidity of Quality's Definition

From its inception as a mere descriptor of a product's or service's inherent characteristics to its present-day association with holistic customer satisfaction, the definition of quality has always been in flux. As disruptive technologies introduce novel products and services and modify existing ones, the criteria by which we judge their quality will invariably change. For instance, the advent of AI might not only enhance the functionality of a product but also introduce ethical dimensions of quality pertaining to fairness, bias, and transparency.

7.2 The AI-Driven Evolution of Quality Metrics

Artificial intelligence, as we have gleaned from previous discussions, is at the forefront of defining the next era of quality. Not only does AI hold the potential to automate and refine the production process, but it also introduces nuanced

dimensions to quality evaluation. Metrics that evaluate the transparency, fairness, and ethical considerations of AI algorithms will become indispensable. Moreover, AI's predictive capabilities can offer insights into prospective quality issues, allowing for preemptive solutions.

7.3 Renewed Focus for Society

As societies grapple with challenges like environmental degradation, socio-economic disparities, and ethical concerns regarding emerging technologies, the perception of quality is gravitating towards a more comprehensive view. A high-quality product in the future might not just be functionally superior but also environmentally sustainable, ethically produced, and socially equitable. Thus, the intertwining of quality with societal values is only poised to get stronger.

7.4 Quality Management: From Tools to Philosophies

Traditional tools of quality management, while still relevant, might gradually give way to more dynamic, adaptive, and comprehensive frameworks. With the deluge of data from IoT devices and the analytical prowess of AI, data-driven quality management will be paramount. However, tools that cannot seamlessly integrate these novel data streams or adapt to the rapid iterations of digital products might become obsolete.

7.5 Embracing the New Quality Paradigm

The future quality paradigm is holistic, integrative, and forward-looking. It recognizes the interplay of technological capabilities and societal expectations. This paradigm understands that while the digital age offers unprecedented precision and customization, it also demands greater responsibility in ensuring fairness, sustainability, and inclusivity.

In this new paradigm, quality transcends being a mere competitive advantage or a compliance checklist. It becomes an ethos, a commitment to deliver value that harmoniously aligns with technological possibilities and societal imperatives.

7.6 Conclusion

The definition of quality will continue to be modified as we move further into this era of rapid technological advancement with artificial intelligence impacting societal changes. While this presents challenges, it also offers opportunities for organizations to innovate, adapt, and lead in crafting a future where quality resonates with both functional excellence and profound societal value. Those poised to embrace this evolving paradigm will not only thrive in their respective domains but also contribute to a more equitable and sustainable world.

Bibliography

1. ISO-the International Organization for Standardization. International Standard ISO 9001 Quality management systems — Requirements [Internet]. 5th ed. Vol. 2015. Geneva, Switzerland: International Organization for Standardization; 2015. Available from: www.iso.org

2. ISO. Quality management systems — Fundamentals and vocabulary. 4th ed. Switzerland: International Organization for Standardization-ISO; 2015.

3. Knowles G. Managing Quality in The 21st Century: Principles and Practice. 1st ed. London: Bookboon; 2017.

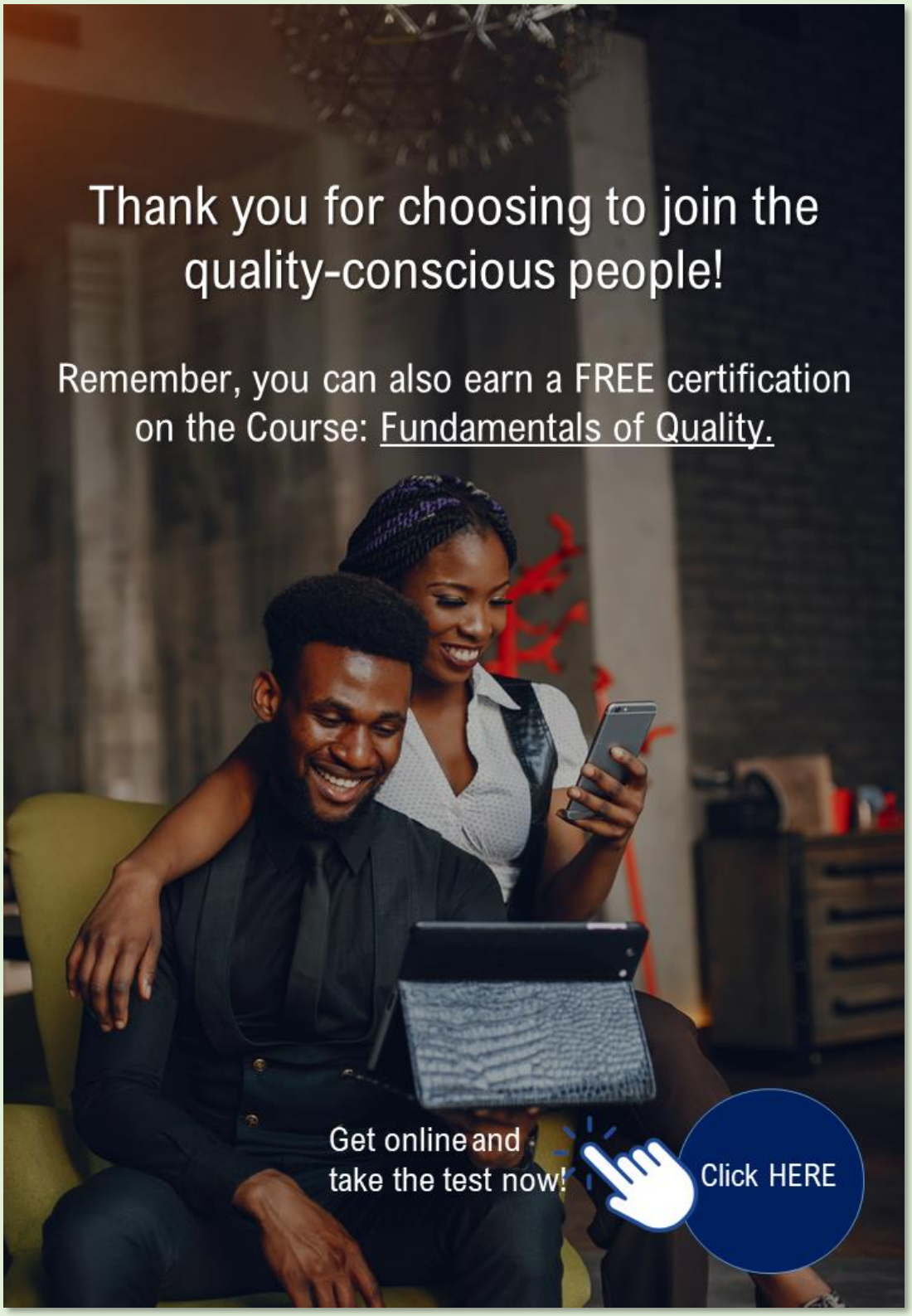
4. ISO-the International Organization for Standardization. Information for Visitors [Internet]. Geneva; 2020. Available from: www.iso.org

5. Oxford English Dictionary. Quality [Internet]. Oxford University Press. 2023 [cited 2023 Jan 20]. Available from: https://www.oed.com

6. Hoyer RW, Hoyer BBY. What is quality? Qual Prog. 2001;34(7):53–62.

7. Chowdhury S. The Ice Cream Maker: An Inspiring Tale about Making Quality the Key Ingredient in Everything You Do. 1st ed. New York: Currency/Doubleday; 2005.

8. American Society for Quality -ASQ. What Are Quality Standards? [Internet]. Quality Resources. 2023 [cited 2023 Jan 10]. Available from: https://asq.org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