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The Quality Infrastructure System in Mexico

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SUMMARY: This research is carried out due to the competitiveness difficulties that Mexico suffers due to its position in the Global Quality Infrastructure Index (GQII Global). Its objectives are to explain the scope of the quality concept, the integrating elements of the Quality Infrastructure System in Mexico, the connotation of the term innovation, economic growth factors, dynamic capabilities and strategic management as components of development, as well as the influence of marketing on quality management. To carry out this research, synthetic, analytical and dialectical methods had to be used fundamentally. Among the most significant results, it was found that export is a significant (not to say definitive or exclusive) reference in determining the degree of development of a country's quality infrastructure; the causes that inhibit the development of a Quality Infrastructure System were identified. From the interpretation and consequences of the findings of this research, the recognition of the advantages of the Quality Infrastructure System is concluded; the unveiling of the challenges that Mexico must overcome to obtain acceptable indicators in the Quality Infrastructure System Indices; the perception of the factors that generate Mexico's recent low indices in the Global GQII, and the encouraging future of Mexico in terms of Quality Infrastructure.

KEYWORDS: Accreditation, Conformity Assessment, Quality Infrastructure, Metrology, Standardization.

INTRODUCTION

This research was exhausted due to the competitiveness obstacles that Mexico suffers from due to its position in the Global Quality Infrastructure Index. Thus, the need for this study is based on the fact that efficient business competitiveness depends largely on the adequate management of its production activities based on the satisfaction of quality parameters.

In turn, in the field of productivity, the infrastructure required for its correct implementation implies the concurrence of various factors translated into the interaction of systems, policies, procedures, structures, etc.:

Production infrastructure comprises the systems, policies, procedures and organizational structures that support production processes (quality management and control, production and inventory planning and control, human resource management, organizational design). (URGAL GONZÁLEZ, 2007, pág. 14)

The justification of the topic is due to the fact that the adoption of managerial decisions must be supported by organizational tactics that favor the application of technological advances to the production of goods, and even to the provision of services, and the satisfaction of minimum standards of quality, but always with the intention and willingness to achieve excellence:

Therefore, the organizational and technological capabilities involved in production must play a relevant role in the decision-making process of a strategic nature, given the possibility that the company can establish a competitive advantage in them. (URGAL GONZÁLEZ, 2007, pág. 14)

By way of background, it should be remembered that in Mexico it is up to the Ministry of Economy to detonate those lines of action of public policies aimed at reinvigorating the National Quality Infrastructure System through the formation of the National Quality Infrastructure Program and its Supplement, which are articulated and exercised through the Executive Secretariat of the National Commission for Quality Infrastructure that address topics and prepare propositional texts for Projects of Official Mexican Standards (NOM), Standards, Mexican Standards (NMX), National Standards of Measurement and Reference Materials, and other documents related to its operation. The Comprehensive System of Standards and Conformity Evaluation (SINEC) deserves particular attention.

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To guarantee compliance with the purposes of the National Quality Infrastructure System, the Quality Infrastructure Law was published on July 1, 2020 in the Official Gazette of the Federation coming into force 60 days later to that of said publication, and with this the Federal Law on Metrology and Standardization was repealed.

The essential object of the new standard is the establishment and development of the foundation on which the industrial policy will rest within the scope of the National Quality Infrastructure System, through the provision and conduct of activities aimed at: (i) standardizing, standardize, and accredit; (ii) evaluate conformity and metrology; (iii) promote economic development and quality in both the production of goods and the provision of services.

The aim of these activities is specifically to promote: (i) the expansion of productive capacity; (ii) continuous improvement in value chains; (iii) the stimulation of international trade, and (iv) the safeguarding of the legitimate objectives of public interest that said legal system protects.

Making a particular reference to the **Supplement to the National Quality Infrastructure Program**, it could be stated that it is a tool intended to plan, conduct, coordinate and report on the activities developed within the framework of normalization, standardization and metrology.

From the perspective of Rachna SHAH and Peter T. WARD, to guarantee the sustained performance of any productive activity, at least the following business practices or policies must be combined: (i) just-in-time delivery; (ii) total quality management; (iii) total preventive maintenance, and (iv) human resources management:

Specifically, we postulate four "bundles" of inter-related and internally consistent practices; these are just-in-time (JIT), total quality management (TQM), total preventive maintenance (TPM), and human resource management (HRM). (SHAH & WARD, 2003, pág. Introduction)

For her part, Begoña URGAL GONZÁLEZ, in Table number 2 of her research work on the influence of production infrastructure on the performance of manufacturing companies, masterfully alludes to the various practices associated with infrastructural production, which are set out below and where the determining role of quality management and its participants appears: (i) statistical process control; (ii) total quality management; (iii) zero defects; (iv) continuous process improvement; (v) worker participation in quality control; (vi) preventive or total productive maintenance; (vii) integration of production information systems with other departments; (viii) integration of production information systems with suppliers; (ix) integration of production information systems with clients or distributors; (x) value analysis; (xi) design for manufacturing; (xii) training programs; (xiii) delegation of authority; (xiv) cross-functional work teams; (xv) job enrichment; (xvi) job expansion; (xvii) reduction of preparation times; and (xviii) reduction of the production and delivery cycle. (URGAL GONZÁLEZ, 2007, pág. 19)

The magnitude of the meaning and scope of the concept of quality has led to the formation and consolidation of a system from which this mechanism of improvement and competitive preeminence is regulated, which requires defining objectives, functions of the participants and certification and accreditation instruments:

The involvement of quality increases and valorizes the advantages of an organization, thus achieving the assurance of products and services that are connected with standards, regulations and laws established by companies, institutions and by the governments themselves, therefore the implementation of a quality system. It must be guided by a professional who manages compliance with the mandatory requirements of the standards: this System, once established and executed, is recognized by a Quality organization that verifies its correct functioning and grants a Scheme Certification. (MOLINA & MARTÍNEZ RUEDA, 2019, pág. 1)

That is why the objective of this work lies in establishing whether the development of a country is commensurable based on the satisfaction of needs based on a well-defined quality measurement parameter and the consecration of credible entities that certify it:

One of the components for the development of a country is focused on the compensation of a good or a service to satisfy a specific need, complying with Quality standards for its preparation and execution, thus inserting them into the local, national or foreign market. (MOLINA & MARTÍNEZ RUEDA, 2019, pág. 1)

As corroborated by Clemens SANETRA and Rocío M. MARBÁN, the elements that contribute to the formal recognition of quality, and that consequently provide meaning to the National Quality Infrastructure, are at least (i) metrology; (ii) standardization; (iii) trials; (iv) accreditation, and (v) certification:

Quality is the result of the integration and coordination of a series of activities in several interrelated areas: metrology, standardization, testing, accreditation, and certification.

For several years, many organizations and cooperation agencies have worked on these issues jointly with the OAS and the result of these varied experiences has resulted in the synergy currently called National Quality Infrastructure. (SANETRA & MARBÁN, 2007, pág. 2)

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The quality identifying device translates into a distinctive seal or sign that is granted after a methodologically supported process with respect to a good or service, in which the satisfaction claims of the consumer or user are invariably considered:
The main purpose of this new concept in the search for Quality is the monitoring of a logical process, starting from measurements until reaching the certification of products and services, certification that can take the form of a quality seal. This quality seal is a guarantee that both the specifications declared by the producer and the consumer (market) requirements are met. A third independent authority is in charge of accreditation and this accreditation is what makes the certifications and, therefore, the quality reliable. (SANETRA & MARBÁN, 2007, pág. 2)

Thus, this study aims to answer the general question: How could Mexico improve its most recent indicators in the Global Quality Infrastructure Index, in order to significantly advance with respect to its current position?

Consequently, we seek to address the secondary questions consisting of: What is the conceptual framework around which the Quality Infrastructure System revolves? What are the theoretical bases on which the Quality Infrastructure System rests? What are the advantages of the Quality Infrastructure System? What challenges must Mexico overcome to obtain acceptable indicators in the Quality Infrastructure System Indices?, and What is the future of Mexico in terms of Quality Infrastructure?

The hypotheses formulated here and that will be subject to demonstration are: H1. - It is feasible to improve the current position of Mexico in the Classification and Sub classification of the Global GQII. H2.- Mexico's low indices in the Global GQII are due to factors such as: (i) the absence of competitiveness in Mexico; (ii) its limited export capacity by conditioning its entry into international coverage markets; (iii) the absence of added value of its products and services for the purposes of modernization and knowledge generation; (iii) the lack of organization of the private productive sector is maintained indefinitely, and (iv) the abstinence from interaction with the government in order to promote self-regulation.

MATERIALS AND METHODS

The development of this research was based mainly on the **documentary** technique of data collection, since, by virtue of the nature of the topic proposed, the exhaustive search is predominantly **heuristic** by virtue of being limited to the study of certain data that make up the System of Quality Infrastructure. By virtue of the above, the **documentary** data search carried out in this research work presents the aspects described below: (i) primary sources have been used predominantly; (ii) the postulates of authors known as classics have been taken advantage of; (iii) the best available literature has been preferred, and (iv) it has not only been compiled, but its scope has been considered and own contributions have been made.

To carry out this research, the following methods had to be used: (i) synthetic (a process by which apparently isolated facts were linked and a theory was formulated that groups the various elements, in this case inherent to the Quality Infrastructure System); (ii) analytical (by which the distinction of the elements of a phenomenon such as the Quality Infrastructure System is identified and accentuated) and each of them is reviewed separately in an orderly manner, (iii) and dialectical (by estimate that the historical, social, economic, political and scientific phenomena corresponding to the Quality Infrastructure system are in perpetual movement, given that reality is not something impassive, but rather susceptible to contradictions, as well as evolution and improvement perennial, and based on this it is intended that all the data (in this case specific to the scope of the Quality Infrastructure System) be studied in relation to others, and in its state of continuous change, by virtue of the fact that said method considers that nothing exists as an isolated object, but that each form or social phenomenon, having its peculiarities, must be assimilated in its internal process of transformation.

RESULTS

The most significant findings refer to the prevailing theoretical and conceptual framework around topics such as: (i) quality; (ii) Quality Infrastructure System; (iii) innovation; (iv) company growth; (v) dynamic capabilities and strategic management, and (vi) marketing. For this reason, the results are presented from authors who have masterfully addressed them.

First Section

Quality

Subsection 1.

Armand Vallin FEIGENBAUM

For this American businessman, the meaning of quality is inherent to customer satisfaction. While producers had traditionally considered quality as an extraordinary element of the production process, consumers attributed it to an implicit nature:

Explicit as possible identification of all customer requirements is a fundamental initial basing point for effective quality control. When this has not taken place, it can create an inherent problem which none of the subsequent control activities can fully meet. There has been a tendency in some industries to consider certain basic customer quality requirements as something "extra," whereas the customers assume them to be part of *any* product they purchase.

… In the phrase "quality control," then, the word "quality" does not have the
popular meaning of "best" in any abstract sense. (FEIGENBAUM, 1951, pág. 8)

As a discussion of this result, we will have to reflect on the contribution of Armand Vallin FEIGENBAUM regarding total quality as a system, by making clear the foolishness of having a clear and well-structured procedure whose essential functions are directed to: (i) identify; (ii) provide documentary support; (iii) coordinate, and (iv) keep each of the substantive activities balanced to ensure compliance with the necessary quality actions in all relevant operations of the company and the production plant.

Armand Vallin FEIGENBAUM's statement that: *"Quality must be designed and built into a product; it can not be exhorted or inspected into it".* (FEIGENBAUM, 1951, pág. 77).

The most significant contribution of Armand Vallin FEIGENBAUM lies in coining the term total quality system by integrating elements of work functionality, machinery, and procedures that guide production in order to achieve customer satisfaction and cost optimization:

A total quality system is the agreed companywide and plant wide operating work structure, documented in effective, integrated technical and managerial
procedures, for guiding the coordinated actions of the work force, the machines, and the information of the company and plant in the best and most practical ways to assure customer quality satisfaction and economical costs of quality.

Quality is, in its essence, a way of managing. And total quality control's organization wide impact involves the managerial and technical implementation of customer-oriented quality activities as a prime responsibility of general management and of the mainline operations of marketing, engineering, production, industrial relations, finance, and service as well as of the quality control function itself at the most economical levels which provide full customer satisfaction. (FEIGENBAUM, 1951, pág. 78 y 829)

Discussing the results on the findings identified in the theoretical position of Armand Vallin FEIGENBAUM, it can be interpreted interpretively stated that the improvement of quality standards would be obtained with: (i) the determination of specific criteria of what is sought to be obtained with a product; (ii) pay particular attention to satisfying the client's needs; (iii) commit to exhausting the efforts required to achieve the formulated quality criteria; (iv) achieve the necessary synergy so that the company's collaborators execute their functions in a coordinated manner; (v) precisely identify the responsibilities that each member of the organization must assume; (vi) create an area dedicated solely and exclusively to implementing the quality control system; (vii) promote constant and correct communication between the members of the company; (viii) make the company's collaborators aware of the relevance of production quality, without the level of the employee or their segment of participation being significant, and (ix) being willing to implement actions that allow course correction in the event of non-compliance with pre-established parameters.

Subsection 2.

W. Edward DEMING

The most significant results of the theoretical thinking of this prominent quality consultant could be discussed, according to the following interpretive extract (DEMING, 1989, págs. 133-144): (i) quality is susceptible to definition based on the subject to whom the power to qualify it is attributed; (ii) one of the greatest difficulties involved in its definition derives from the anticipation of the potential needs of the user, and therefore from the possibility of anticipating the features of the product that allow its design and production with great potential for satisfaction in congruence with the cost that your consumer must pay; (iii) the rating scales for a product or service are diverse, which leads to its high weighting in some segments and low weighting in others; (iv) the function of a product placed on the market is not limited to attracting customers and making sales, but must also provide a service and be functional; (v) studies on consumer behavior are necessary and must be aimed at understanding their requirements and aspirations, without forgetting that products and services must offer an improvement in life; (vi) the study of consumer reactions is essential since it allows us to predict not only the demand rates for the product or service (a situation that guides the setting of production levels) but also their variable requirements, thereby favoring continuous improvement in the production; (vii) the concept of quality must be included within the standards of production or provision of services, so it is not necessary for the client to express any disagreement or dissatisfaction (an analysis of complaints

or warranty costs is not sufficient), and (viii) quality improvement systems are beneficial for the sectors of production of goods or provision of services, since they not only increase production or provision of the service, but also reduce their costs.

Subsection 2.

Joseph M. JURAN y Joseph A. DE FEO

Currently considered the father of quality management, Joseph M. JURAN suggests various methods and techniques that promote excellence in performance. In fact, as a product of the discussion of the results of this research, the offer of a model and transformation map that allows us to know what to expect in that area is interpreted. It recognizes that cultural change is difficult to achieve and that its success will depend on adopting a comprehensive approach if it is to be sustained. It also specifies that the achievement of quality is conditional on five organizational advances: (i) **leadership and management**; (ii) **organization** and **structure**; (iii) **current performance**; (iv) **culture**, as well as (v) **adaptability** and **sustainability**. (JURÁN & DE FEO, 2010)

Second Section

Quality Infrastructure System

Subsection 1.

Ulrich HARMES-LIEDTKE y Juan José OTEIZA DI MATTEO

Quality infrastructure is considered a system for satisfying expectations or minimum standards.

It was in June 2017 that a definition of Quality Infrastructure was formally adopted based on the consensus of the following international organizations: *BIPM Bureau International des Poids et Mesures; IAF International Accreditation Forum; IEC International Electrotechnical Commisssion; IIOC Independent International Organisation for Certification; ILAC International Laboratory Accreditation Cooperation; IQNET International Certification Network; ISO International Organization for Standardization; ITC International Trade Centre; ITU International Telecommunications Union; OIML Organisation Internationale de Métrologie Légale; UNECE United Nations Economic Commission for Europe; UNIDO United Nations International Development Organization; WBG World Bank Group, y WTO World Trade Organization.*

The system comprising organizations (public and private) together with the policies, relevant legal and regulatory framework, and practices necessary to support and improve the quality, safety and environmental soundness of goods, services and processes. Quality infrastructure is necessary for the effective functioning of domestic markets, and its international recognition is essential to enable access to foreign markets. It is a critical element to promote and sustain economic development and environmental and social well-being. It is based on metrology, standardization, accreditation, conformity assessment and market surveillance (in regulated areas). (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 13)

Thus, from the discussion of the results based on the contributions of Ulrich HARMES-LIEDTKE and Juan José OTEIZA DI MATTEO, it is interpreted that the Quality Infrastructure is a definition and control system made up of four fundamental elements: (i) **standardization**; (ii) **metrology**; (iii) **accreditation**, and (iv) **conformity assessment:**

The CI describes a system of institutions that guarantee the definition and control of quality criteria. The main technical components of a national quality infrastructure (NCI) are:

- **Standardization** is the activity that consists of establishing, in relation to real or potential problems, provisions of common and repeated use aimed at achieving the optimal degree in each context.

… - **Metrology** is the science of measurement and its application, covering both the experimental and theoretical determination of any level of uncertainty in any field of science and technology. Metrology consists of the definition of internationally accepted units of measurement, the application of measurement standards and the guarantee of international traceability of measurements.

… - **Accreditation** is the formal attestation or declaration by an independent third party (accreditation body, OA) that a conformity assessment body (CAB) is competent to carry out specific services. A national accreditation body (NAB) is an institution that attests to the competence and impartiality of OECs, according to international standards such as ISO/IEC. Some countries have more than one OA.

- **Conformity assessment** demonstrates that the specified requirements of products, processes, systems, people or organizations comply with the standards and requirements covered by the conformity assessment activities of ISO/IEC 17000. The requirements are usually included in technical standards and regulations. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 11)

We will have to make a parenthesis to point out that in the Mexican legal regime, and specifically in the Quality Infrastructure Law, we find that section XXII of article 4, defines the **National Quality Infrastructure System** in the following way:

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Article 4. For the purposes of this Law it is understood as:

… XXII.- National Quality Infrastructure System: the system that aims to coordinate the authorities of all levels of government in their respective areas of competence, the Standardizing Authorities, the National Metrology Center, the Designated Institutes of Metrology, to the Accreditation Entities, to the Conformity Assessment Bodies, to the National Standardization Bodies and to the subjects empowered to standardize, through regulations, strategies and principles so that the national policy on normalization, standardization, Conformity Assessment and metrology, which promotes quality and economic development.

According to article 1 of the Quality Infrastructure Law for the Mexican government, the object of said regulation and therefore of the National Quality Infrastructure System, lies in: (i) promoting economic development and quality in the production of goods and services, in order to expand productive capacity and continuous improvement in value chains; (ii) promote international trade, and (iii) protect the legitimate objectives of public interest provided for in said legal system.

The discussion of the results at the international level leads to the interpretation that the Global Quality Infrastructure Index GQII plays a significant role in measuring quality infrastructure by using indicators composed of comparison and categorization of performance between nations, inspired by the Handbook on Constructing Composite Indicators, whose benefits with respect to individual indicators are pointed out below:

Composite indicators are of great interest to compare and classify the performance of countries in areas such as industrial competitiveness, sustainable development, globalization and innovation. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 24)

Thus, this Index is established as a free, collaborative platform for the concentration of open and reliable data to benefit the development of quality infrastructures supported by freely accessible information.

Furthermore, in the field of accreditation, the Global Quality Infrastructure Index (GQII) seeks to facilitate access to indicators with cross-border effects, which is why it relies on freely accessible databases, which consequently represents a significantly greater task complex of homologation, in addition to the fact that some of the accreditation bodies (OA) lack recognition in the international environment:

…The GQII only uses publicly available data

The core data sources are:

• The Key Comparison Database (KCDB) and the BIPM website

• The ISO survey (2020) and the ISO and IEC websites

• The IAF and ILAC websites, as well as the databases on accredited conformity assessment bodies from the websites of one hundred and sixty-four (164) accreditation bodies around the world. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 30)

It will be necessary to be aware that the information provided by the Global Quality Infrastructure Index favors the comparison of data with respect to other types of classifiers with international coverage such as the Economic Complexity Index (ECI, for example). its acronym in English), by which the productive capacities of a locality are measured based on its degree of participation in activities where the figures related to the generation of jobs, the operation of industries or the amount of exports are significant).

Aside from the strictly quality improvement purposes sought by the Global Quality Infrastructure Index, it is worth highlighting the laudable social and democratic goal it pursues, since free access to the data it concentrates aims to contribute to: (i) supporting organizational and institutional decision making; (ii) regenerating the life scenarios of the population, and (iii) modifying the schemes for the exercise of power:

Our idea is to promote access and democratization of CI data, as well as drive data-driven decisions that enhance CI around the world. The GQII aims to unite people in groups of actors capable of achieving significant improvements in living conditions and changing entrenched power structures. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 8)

Based on the criteria defined by the Global Quality Infrastructure Index, the indicators that emerge as an interpretation of the results of this research are detailed below. The basic components of quality infrastructure are: (i) **metrology**; (ii) **standardization**; (iii) **accreditation**, and (iv) **conformity assessment**.

Regarding the metrology component, it is interpreted from the discussion of the research findings obtained here that it is made up of five indicators to which similar scores are attributed: (i) affiliation to recognized international and regional organizations prestige in the field of metrology; (ii) active collaboration in the advisory commissions of the International Committee of Weights and Measures or CIPM; (iii) the degree of attention to the Calibration and Measurement Capabilities (CMC) areas; (iv) the number of key and complementary comparisons (K&SC), and (v)) the number of accredited calibration laboratories in the country.

It will be necessary to emphasize as an interpretation of the discussion of the result of this research that, in the segment of affiliation to international and regional organizations of recognized prestige in the field of metrology, the

International Bureau of Weights and Measures appears as such (Bureau International des Poids et Mesures or BIPM by its acronym in French), the International Organization of Legal Metrology (Organisation Internationale de Metrologie Légale or OIML by its French acronym); the Intra African Metrology System (or Système Intra-Africain de Métrologie o AFRIMETS); the Association of Proposal Management Professional and also identifiable as APMP for its acronym in English); the European Association of National Metrology Institutes or EURAMET); the Gulf Association for Metrology or GULFMET for its acronym in English; the Inter-American Metrology System o SIM); the Euro-Asian Cooperation of National Metrology Institutes (o COOMET). (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 35)

Regarding the standardization component as a quality mechanism, as a consequence of the discussion of the result obtained in this research, its integration is interpreted by three indicators with similar or comparable valuation: (i) registration in organizations with international coverage in matters of normalization like the International Organization for Standardization (also identified as ISO for its acronym in English) or the International Electrotechnical Commission (or IEC by its acronym in English); (ii) the significant collaboration in the technical committees of the International Organization for Standardization, and (iii) the number of companies certified through the parameters of the recognized Management Systems. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 35)

Regarding the accreditation components as a quality measurement instrument, it is interpreted from the discussion of the results obtained that their measurement is carried out through five indicators to which an equivalent weight is attributed: (i) the membership in accreditation organizations with influence at the regional and international levels (such as
International Laboratory Accreditation Cooperation or ILAC by its acronym in English; the International Acreditation Forum or IAF; the African Accreditation Cooperation o AFRAC by its acronym in English; the Asia Pacific Accreditation Cooperation also identifiable by its English acronym APAC; the Arab Accreditation Cooperation o ARAC for its acronym in English; the European Cooperation for Accreditation or EA by its acronym in English; the Inter-american Accreditation Cooperation or IAAC by its acronym in English; the Southern African Development Community Accreditation Service known as SADCAS by its acronym in English); (ii) the degree of compliance with accreditation systems that have international acceptance based on mutual recognition agreements; (iii) the volume of entities dedicated to conformity assessment that are accredited for the certification of products based on ISO/IEC 17065:2012 — Conformity evaluation — Requirements for organizations that certify products, processes and services); (iv) the number of organizations that have accreditation in the field of management systems based on ISO/IEC 17021-1:2015 – Conformity assessment. Requirements for bodies providing auditing and certification of management systems; (v) the index of bodies accredited according to ISO/IEC 17025 Testing and calibration laboratories. (HARMES-LIEDTKE & OTEIZA DI MATTEO, 2021, pág. 35)

Regarding Conformity Assessment, its application mechanisms include: (i) **inspection**; (ii) the **application of tests**; (iii) **certification**; (iv) **validation**, and (v) **verification**.

It could be stated synthetically and by way of interpretation of the discussion of the results of this research, that: (i) **accreditation** refers to a process of systematic and voluntary evaluation and monitoring of compliance with quality criteria and standards of products and processes; (ii) **certification** focuses on the competencies, knowledge and professional abilities of people based on parameters considered optimal; (iii) **standardization** entails the inspection of activities and products to verify compliance with normative references, whether national or international, (iv) **metrology** as a science of measurements focuses on the quantitative measurement of the properties of objects, and is It fundamentally refers to the scientific and industrial fields through testing, calibration and clinical laboratories, and (v) **conformity assessment** focuses on inspection, testing, certification, validation, and verification. All of these references contribute to strengthening the value chain as an auxiliary strategic analysis instrument in determining the competitive advantage of companies.

Third Section
Innovation
Subsection 1.
Nicole RIPPING

For the prominent economist Nicole RIPPING, innovation is conceived as a process that implements improvements, both in productivity and in the organizational field, but always characterized by its novelty, even when it does not seem so in the eyes of its competitors:

“This paper is based on the definition of innovation as the process by which firms master and implement the introduction of product, process or organisational improvements which are new to them, irrespective of whether or not they are new to their competitors domestic or foreign”. (RIPPING, 2008, pág. 7)

Subsection 2.

Henry William CHESBROUGH

Of singular relevance is the distinction made by Henry William CHESBROUGH, professor at the Harvard Business School, regarding the concepts of innovation and invention. From the perspective of this theorist, innovation represents the implementation of the invention through its implementation in the market:

By *innovation* I mean something quite different from *invention*. To me, innovation means invention implemented and taken to market. And beyond innovation lies *disruptive innovation,* which actually changes social practices—the way we live, work, and learn. Really substantive innovation—the telephone, the copier, the automobile, the personal computer. (CHERBOURGH, 2003, pág. ix)

This author delves into the topic of "open innovation" with the aim of "innovating innovation", proposing the terms "disruptive innovation" and "meta-innovation". Among the most significant challenges of innovation seen from the perspective of Henry William CHESBROUGH, the one related to predicting the impact that the products of technological advance could have on social practices is identified:

Disruptive innovation presents some major challenges. First, although it may be relatively easy to predict the potential capabilities of a technological breakthrough in terms of the products it enables, it is nearly impossible to predict the way that these products or offerings will shape social practices. (CHERBOURGH, 2003, pág. ix)

Regarding the contributions of meta-innovation, Henry William CHESBROUGH, distinguishes a series of tools, among which the following stand out: (i) new technologies (which favor the supplier of goods or provider of services by bringing them closer to the practices of its current and potential clientele, which will lead to the integration of a prototype relevant to the satisfaction of clientele needs), and (ii) financial instruments (by facilitating business modeling with innovation, making the balance between risk prevention and the budgetary restrictions to which companies are subject):

As an interpretive conclusion and product of the discussion of the findings of this research, we agree with Henry William CHESBROUGH's assertion that a society concerned with investing in increasing knowledge, acquiring people's skills and Institutionalization of support for the exchange of knowledge will guarantee a bright and prosperous future for citizens.

Subsection 3.

Tom KELLEY

From the human side, what is interpreted from the discussion of the results on innovation is that it must be analyzed based on the collaborators who promote it within an organization, and which, according to Tom KELLEY, would be the ten people following who would favor it: (i) three learning people; (ii) three organization people, and (iii) four people construction. (KELLEY, Spring-Summer 2006)

As far as learning people are concerned, these should be: (i) *the anthropologist)*; (ii) *the experimenter*, and (iii) the *cross-pollinator.*

Regarding the organizational personnel, the following are identified: (i) *the hurdler);* (ii) *the collaborator,* and (iii) *the director.*

Finally, and regarding the construction of people, it is required: (i) *the experience architect)*; (ii) *the set designer;* (iii) *the caregiver*, and (iv) *the storyteller.*

Subsection 4.

Richard R. NELSON y Sidney Graham WINTER

Among the significant theoretical contributions related to business innovation we find the postulates of economics professors Richard R. NELSON (particularly through his Evolutionary Theory of Economic Change), and Sidney Graham WINTER.

The first revealing contribution is found in the very meaning of innovation, considering that it includes technological evolutionary processes, a scope that necessarily links with the definition of theory, which is considered an intellectual representation of present knowledge aimed at promoting predictably decision-making:

We are using the term innovation as a portmanteau to cover the wide range of variegated processes by which man's technologies evolve over time. By a theory we mean a reasonably coherent intellectual framework which integrates existing knowledge, and enables predictions to go beyond the particulars of what actually has been observed. (NELSON & WINTER, 1977, págs. 181-182)

These distinguished economists are aware that in terms of innovation there are two specific policies: (i) the one that ensures that technological development represents an indisputable mechanism of progress (with which they fully agree), and (ii) the one that asserts that the high range of knowledge allows objectives to prevail (which they consider ostentatious):

The current dialogue regarding policy toward innovation rests on two premises. The first is that technological advance has been a powerful instrument of human progress in the past. The second is that we have the knowledge to guide that instrument toward high priority objectives in the future. The first premise is unquestionable: the latter may be presumptuous. (NELSON & WINTER, 1977, págs. 181-182)

In the experience of these professors, although it is true that research and development are decisive in increasing productivity, it is also true that this is largely due to the positioning of the product over time:

In simple correlational analysis, he finds that productivity growth in an industry is related to research and development spending. However, productivity growth also is strongly correlated with growth of the output of the industry over time. (NELSON & WINTER, 1977, pág. 189)

Thus, the interpretation resulting from the discussion of the findings of this research is that these economists assertively explain that the escalation of productivity is proportional to the implementation of innovative technologies, as well as the critical and permanent analysis of the need to update the technological tools present:

More formally, in an accounting sense we view productivity growth as explained within our proposed theoretical structure in terms of first, the generation of new technologies, and second, changes in the weights associated with the use of existing technologies. (NELSON & WINTER, 1977, pág. 193)

Another reality that reveals the elucidation of the discussion of the results of this research is the contribution of such renowned economists in stating that the success of productivity lies not only in having technologies that allow innovation, but that timely decision to implement them, because it is the only way to deal with negative externalities:

A necessary condition for survival of an innovation is that, after a trial, it be perceived as worthwhile by the organizations that directly determine whether it is used or not. (NELSON & WINTER, 1977, pág. 208)

While externalities pervade the innovation process they are greatest in the activities that generate understanding and data. (NELSON & WINTER, 1977, pág. 220)

Fourth Section.

Growth of the company

Subsection 1.

Edith Elura Tilton PENROSE

In the valuable opinion of the famous economist Edith Elura Tilton PENROSE, the relevance of the theory of the company is admitted, but she questions its approach from a limited perspective of monopoly and economic competition, as well as the methodological difficulty of determining production costs and pricing, so it is necessary to implement innovative activities that allow organizations to generate profitable products:

A strong case can be made for the big firm and for “big business” competition, especially with respect to the rate of development of new technology and new and improved products, and it may be that economists have been slow to recognize some of its advantages. Part of the reason for this, I think, can be traced to the influence on economic analysis of the so-called “theory of the firm”, which has tended to confine the theoretical approach to the firm within the frame of reference provided by the traditional categories of monopoly and competiton and by the problems of price and output determination. In consequence, this part of economic theory has attained a high state of refinement, but, as we saw in Chapter II, it does not provide suitable tools for the analysis of the growth and, in particular, of the innovating activities of firms treated as administrative organizations free to produce any kind of product they find profitable. (PENROSE, 1959, pág. 260)

It is interpreted from the discussion of the comparative analysis between business competence and management competence that Edith Elura Tilton PENROSE shows that the concept of business is closely related to the greedy vehemence of people, but that its absence does not necessarily mean that business management is carried out properly:

Entrepreneurial Versus Managerial Competence

“Enterprise” is obviously closely related to “ambition”, but even if a firm is not very ambitious it may nevertheless be competently managed. (PENROSE, 1959, pág. 34)

The economist in question reveals the existence of a segment of entrepreneurs who are not willing to obtain profits higher than usual if this entails taking risks, investing or making extraordinary efforts:

There are many businessmen, and very efficient ones too, who are not trying always to make more profits if to do so would involve them in increased effort, risk, or investment. In many industries and areas there are a considerable number of firms which have been operating successfully for several decades under competent and even imaginative management, but have refrained from taking full advantage of opportunities for expansion. Many of these are “family firms” whose owners have been

content with a comfortable profit and have been unwilling to exert themselves to make more money or to raise capital through procedures that would have reduced their control over their firms. (PENROSE, 1959, pág. 34)

It is not reasonable to expect all businessmen to devote their last ounce of energy to making money. (PENROSE, 1959, págs. 34-35)

Fifth Section.

Dynamic capabilities and strategic management

Subsection 1.

David J. TEECE

The interpretation of the results derived from the analysis of the thought of the economist and international business professor David J. TEECE, allows us to conclude that the essence of multinational companies lies in their dynamic capabilities, which are classified into: (i) Dynamic Capabilities through of the Selection and Implementation of Routine Processes; (ii) Dynamic capabilities through the selection and implementation of improved business "models"; (iii) Dynamic capabilities through investment options: the special role of complementary and co-specialized assets; (iv) Dynamic capabilities through asset orchestration, knowledge sharing and coordination; (v) Dynamic capabilities through efficient learning, technological development and intellectual property protection. (TEECE, 2009, págs. 157-164)

David J. TEECE's opinion is extremely valuable in the sense that dynamic capabilities become required to the extent required by the changing commercial scenarios where multinational companies compete, so their performance will be measured based on relevance of your organizational skills:

Factors that make replication difficult also make imitation difficult. Thus, the more tacit the MNE's productive knowledge, the harder it is to replicate by the MNE itself or its competitors. When the tacit component is high, imitation may well be impossible, absent the hiring away of key individuals and the transfers of key organization processes. In conclusion, the concept of dynamic capabilities, when applied to the MNE, highlights organizational and (strategic) managerial competences which can enable an MNE to achieve superior performance. Key ingredients are difficult to replicate routinized processes, the basic manner in which a business is designed, as well as the decision frames, heuristics, and protocols which enable MNEs to avoid poor investment choices and embrace astute ones. (TEECE, 2009, pág. 168)

The renowned economist David J. TEECE reveals five integrative tools that provide functionality to dynamic capabilities: (i) innovation; (ii) identification of the business model to implement; (iii) adequate investments; (iv) timely negotiation, and (v) relevant governance:

Lying at the heart of dynamic capabilities are five fundamental management/organizational skills: (1) learning and innovation processes; (2) business "design" competence (what business model to employ); (3) investment allocation decision heuristics; (4) asset orchestration, bargaining, and transactional competence; and (5) efficient governance and incentive alignment. Buttressing these is an understanding of the processes of imitation and the strategies and processes that can be used to protect intellectual property. Widely diffused managerial and organizational competence cannot be core elements of an MNE's dynamic capabilities. (TEECE, 2009, págs. 168-169)

Not all business decisions belong to the category of dynamic capabilities, since the latter are fundamentally based on management competencies and the design of the company itself. The competitive advantage of multinational companies depends to a considerable extent on their dynamic capabilities, which fundamentally include: (i) innovation practices (technological, generation of new business models, regulatory self-regulation); (ii) risk management protocols derived from situations of uncertainty or negative externalities; (iii) permanent adaptation of its asset portfolio, as well as (iv) monitoring and attention to the market structure:

Types of (Dynamic) Capabilities

In competitive global environments MNEs must proactively adjust their portfolio of assets and competencies in order to build and sustain competitive advantage. Many factors can trigger the need to refine and sometimes reconfigure an MNE's business model, and its assets and competences. Exogenous events (e.g. recession, enhanced competition, exchange rate movements, regulation) will require responses. So will technological innovations, and the emergence of new competitors using different business models. However, not all enterprise-level responses to innovation and change are manifestations of dynamic capabilities. As Sidney Winter (2003) notes, "ad hoc problem solving" isn't necessarily a capability.

The microfoundations of the MNE's dynamic capabilities include difficult to imitate organizational-level innovation, change, global sourcing and global marketing routines; the business intuition and insight needed to create new business models and revenue architectures that scale globally; the investment insights, protocols, and procedures which enable the business enterprise to identify and address new markets and technologies. Finally, dynamic capabilities include the capacity to calibrate

uncertainty, and continuously effectuate the coalignment and efficient governance of cospecialized assets domestically and internationally. Do note that dynamic capabilities are rooted in large part in the capabilities of management and in the design of the enterprise. (TEECE, 2009, pág. 157)

When reference is made to dynamic capabilities, attention is normally focused on products or services, but monitoring of market structure is necessary when a dominant scheme appears for future placement. This is due to the potential concern that germinal competition in the market for products or services will be paralyzed in a market that does not yet exist but whose introduction is imminent:

1. Market structure is not a meaningful concern, at least not until a dominant design has emerged, and the evolutionary paradigm is established and likely to remain for quite some time.
2. If the analysis is to be deflected away from products in the market, the natural place to look is at capabilities. These transcend products.
3. Only if the merger entities are the only ones with the necessary capabilities to innovate in a broad area should concerns arise. Katz and Shelanski suggest that if new product development efforts are under way to create or improve products and processes, and these products are not yet in the market, then harm arises from a merger because it may cripple future product market competition in a market that does not exist. A capabilities approach would soften such concerns— the question should be framed not in terms of whether product market competition will be impaired— as that is too much of an immediate concern— but whether capabilities will be brought under unitary control, thereby possibly thwarting future variety in new product development. (TEECE, 2009, pág. 256)

Sección Sexta.

Marketing

Subsección 1.

Philip KOTLER y Gary ARMSTRONG

The renowned economics professor Philip KOTLER offers us a dual definition of marketing by viewing it both from a business management area and from a social perspective, which allows him to attribute to it an art categorization and even a scientific weighting in the identification and conservation of clientele:

Defining Marketing

We can distinguish between a social and a managerial definition for marketing. According to a social definition, **marketing** is a societal process by which individuals and groups obtain what they need and want through creating, offering, and exchanging products and services of value freely with others.

As a managerial definition, marketing has often been described as “the art of selling products.”

… We see marketing management as the art and science of applying core marketing concepts to choose target markets and get, keep, and grow customers through creating, delivering, and communicating superior customer value. (KOTLER, Marketing, Management, Millenium Edition, 2000, pág. 4)

In marketing, the opinions of the economist and father of marketing Philip KOTLER and the business specialist Gary ARMSTRONG are extremely valuable, mainly by accentuating the importance: (i) of the phases through which the buyer goes in his attempt to satisfy his requirements; (ii) the role that the political environment plays in marketing decision-making, and (iii) the impact of growing regulatory regulation in the field of business.

Based on an adequate interpretation of the postulates of the aforementioned authors, the result obtained is to affirm that the purchasing decision, and specifically the one related to the acquisition of new products, goes through stages - not necessarily successive and ordered - where Product innovation is a significant decision-making reference: (i) awareness of the presence of a new product; (ii) expression of interest in knowing details of the product; (iii) evaluation of the concern of trying the product; (iv) incipient testing of the product where aspects such as innovation, quality, the benefits provided by the product in meeting consumer needs, satisfaction of consumer expectations, and (v) adoption of the firm are assessed determination of purchase and regular use of the product:

The decision process purchase for new products

We have seen the stages that buyers go through when trying to satisfy a need. The passage through these stages can be fast or slow, and some stages can even be reversed. Much depends on the nature of the buyer, the product, and the purchasing situation.

Now we will see how buyers approach the purchase of new products. A new product is a good, service or idea that some potential consumers perceive as novelty. The product may have appeared some time ago, but what we are interested in is seeing how consumers initially find out about the existence of the products and decide whether to adopt them or not. We

define the adoption process as "the mental process that a person follows from learning about an innovation to its final adoption"; and adoption, as the decision a person makes to become a regular user of the product.

Stages of the adoption process adoption process of a new product.

Consumers go through five stages in the process of adopting a new product:

Awareness: The consumer realizes that the new product exists, but lacks information about it.

Interest: The consumer seeks information about the new product.

Evaluation: The consumer considers whether it makes sense to try the new product.

Testing: The consumer tests the new product on a small scale to better estimate its value.

Adoption: The consumer decides to fully and regularly use the new product. (KOTLER & ARMSTRONG, Fundamentos de Marketing, 2011, pág. 145)

Marketing decisions are influenced by the political context whose determinations (materialized through public policies) can favor or limit the development of economic activity. Regulatory regulation (as long as it is not exaggerated) encourages business relationships, particularly when it exercises control or guarantees aspects such as free economic competition, environmental protection and consumer rights, the social responsibility of the entrepreneur, advertising to avoid that is misleading, and the standardization of production processes to guarantee quality and consequent consumer loyalty:

POLITICAL ENVIRONMENT Events that take place in the political environment markedly affect marketing decisions. The political environment consists of laws, government agencies, and pressure groups that influence and limit various organizations and individuals in a given society. Laws that regulate business even the most liberal supporters of free market economies accept that the system works better with some regulation. Smart regulation can foster competition and ensure fair markets for goods and services. That's why governments develop public policies to guide commerce—sets of laws and regulations that limit businesses for the good of society as a whole. Almost all marketing activities are subject to a wide range of laws and regulations. Political environment Laws, government agencies, and pressure groups that influence and limit various organizations and individuals in a given society. (KOTLER & ARMSTRONG, 2011, pág. 83)

INCREASE IN LEGISLATION. Around the world, the number of laws affecting business has steadily increased over the years. The United States has many laws that cover issues such as competition, fair trade practices, environmental protection, product safety, truthful advertising, respect for consumer privacy, packaging and labeling, pricing, and other important areas (see table 3.2). The European Commission has established a new legal framework that covers competitive conduct, product standards, product liability, and commercial transactions between the nations of the European Union. Several countries have gone further than the United States in passing strong consumer protection laws. (KOTLER & ARMSTRONG, 2011, pág. 83)

In the opinion of Philip KOTLER, business marketing usually moves through three stages: (i) *entrepreneurial marketing* where most companies trigger their activity through individuals who focus their attention on identifying a spectrum of opportunities and They dedicate themselves to playing all the right songs to attract customer attention; (ii) *formulated marketing*, since as a small business is successfully consolidated, it will move towards more elaborate marketing strategies, and (iii) finally, *intrapreneurial marketing*, which is typical for large companies or business consortia and where the degree of sophistication of marketing skills is based on the study of the results or market qualifications of the products to be placed, since the research reports refine the relationships with the potential clientele and therefore the focus of the advertising messages to be transmitted. (KOTLER, Marketing, Management, Millenium Edition, 2000, pág. 2)

Regarding the segments likely to receive the benefits of marketing, these are: (i) goods; (ii) services; (iii) experiences; (iv) events; (v) people; (vi) places; (vii) properties; (viii) organizations, (ix) information, as well as (x) ideas.

Consequently, there is a close link between the quality infrastructure system and marketing, as the latter exerts considerable influence on the consumer but commits him to supporting the entrepreneur's offer with quality arguments that justify the price in proportion to the benefits that the acquirer will receive:

All marketers need to be aware of the effect of globalization, technology, and deregulation. Rather than try to satisfy everyone, marketers start with market segmentation and develop a market offering that is positioned in the minds of the target market. To satisfy the target market's needs, wants, and demands, marketers create a product, one of the 10 types of entities (goods, services, experiences, events, persons, places, properties, organizations, information, and ideas). Marketers must search hard for the core need they are trying to satisfy, remembering that their products will be successful only if they deliver value (the ratio of benefits and costs) to customers. (KOTLER, Marketing, Management, Millenium Edition, 2000, pág. 16)

DISCUSSION

As far as the concept of quality is concerned, there is uniformity in the attribution of a meaning by the authors mentioned **Armand Vallin FEIGENBAUM, W. Edward DEMING, Joseph M. JURAN,** and **Joseph A. DE FEO**, agreeing that it is an attribute

inherent to the integral satisfaction of the consumer of the good or service provider and not as an extraordinary ingredient to the production process or provision of services, weightable based on different assessment scales and according to the various consumer segments.

Regarding the Quality Infrastructure System, a cohesion of criteria is identified by the authors mentioned here **Ulrich HARMES-LIEDTKE** and **Juan José OTEIZA DI MATTEO,** who conceive it as a form of collaborative quality management through the conjunction of efforts of the public and private sectors, to promote effective and efficient development of markets and thereby generate population well-being with the implementation of standardization, metrology, accreditation and conformity evaluation mechanisms.

Innovation has meant, for the group of writers evoked in this work **Nicole RIPPING, Henry William CHESBROUGH, Tom KELLEY, Richard R. NELSON** and **Sidney Graham WINTER**, a process by which the implementation of improvements is achieved, not only in the area of productivity or provision of services, but also in what refers to the organizational field, with the condition that it bears distinctive signs of first-rate, even though this may not seem obvious to its competitors but is felt and appreciated by the consumer.

In terms of sustainable growth, the possibility of companies achieving it by generating profitable products has been indisputable, but the theorist in question **Edith Elura Tilton PENROSE** recognizes the presence of a sector of entrepreneurs that is not willing to obtain profits greater than the usual ones if this involves taking risks, investing or making extraordinary efforts.

Regarding dynamic capabilities, these become indispensable for the author emulated here by **David J. TEECE**, and those required by the variability of the commercial scenarios where multinational companies compete will be required, which means that their performance is directly proportional to the congruence of their organizational skills.

For the well-known authors on the subject of marketing **Philip KOTLER** and **Gary ARMSTRONG,** although it is true that marketing specialists begin with market segmentation and developing a product or service offering that is positioned in the mind of the target market, their success will depend really the delivery of value to the consumer who will verify the existing proportion between benefits and costs.

Comparative table resulting from the discussion

Discussed topic	Similarity	Difference	Limitation	Advance
Quality.	1. - **Armand Vallin FEIGENBAUM**.- It is inherent to customer satisfaction. While producers had traditionally considered quality as an extraordinary element of the production process, consumers attributed it to an implicit nature. 2.- **W. Edward DEMING**.- The attribute of a product placed on the market is not limited to customer attraction and sales, but must also provide a	Quality analysis focuses not only on the production process but also on the functionality of the product or service and customer satisfaction.	The discussion is limited to the points of view of writers who focus their analysis of quality on the experience of developed countries without addressing the particularities of those from emerging economies.	It is possible to amalgamate the most significant contributions of quality experts in the international context and highlight the validity of their applicability to the current time.

	service, be functional; 3. - **Joseph M. JURAN and Joseph A. DE FEO.** - The achievement of quality is conditioned by five organizational advances: (i) leadership and management; (ii) organization and structure; (iii) current performance; (iv) culture, as well as (v) adaptability and sustainability.			
Quality Infrastructure System.	**1. - Ulrich HARMES-LIEDTKE** and **Juan José OTEIZA DI MATTEO. -** Quality infrastructure is considered a system for satisfying expectations or minimum standards.	The approach to the Quality Infrastructure System is based on its conception as a critical element to promote and sustain economic development and environmental and social well-being.	Only the **Global Quality Infrastructure Index GQII** is taken as a reference because it plays a significant role in measuring quality infrastructure, but the various alternatives that exist at the international level are left aside.	The certain date of universal consensus is identified as a definition and control system made up of four fundamental elements: (i) **standardization**; (ii) **metrology**; (iii) **accreditation**, and (iv) **conformity assessment**.
Innovation.	1. - **Nicole RIPPING.-** Innovation is conceived as a process of implementing improvements, both in productivity and in the organizational field, but always characterized by its novelty, even when it does not seem so in the eyes of its competitors. 2. - **Henry William**	The novelty of the production process is limited to improvements within the organization, losing sensitivity to what the environment demands and therefore moving away from objective reality. By innovation he refers to something very	The novelty element is visible only from the perspective of the producer of the good or provider of the service, without considering the opinion of the direct competitive market. Innovation is exclusively analyzed with	It is possible to identify the evolution that the concept of innovation has had, from its first significant influence, to the position that contemporary scholars have assumed in this regard, resulting in the conjunction of elements of a productive order, technological advance, as well as the collaborative nature of the staff in the organization.

	CHESBROUGH. - Innovation means invention implemented and brought to the market. **3.-** Tom KELLEY.- **The results of innovation depend on the collaborators who promote it within an organization, which would be: (i) three learning people; (ii) three organization people, and (iii) four people construction.** 4. - **Richard R. NELSON and Sidney Graham WINTER**.- The escalation of productivity is proportional to the implementation of innovative technologies, as well as the critical and permanent analysis of the need to update the technological tools present.	different from invention. Innovation rates depend on the makeup of the organization's collaborators. Technological innovation favors productivity.	respect to the production of goods, but no position is established regarding the provision of services. It only focuses on the attributes of the personnel, overlooking the requirements of the production processes. The permanent investment in technological advances will imply a cost that not all organizations can afford.	
Growth of the company.	**Edith Elura Tilton PENROSE.-** Admits the relevance of the theory of the company, but questions its approach from a limited perspective of monopoly and economic	Business growth depends on factors such as innovation (which implies making investments), extraordinary effort and profitability.	It reveals the existence of a segment of entrepreneurs who are not willing to obtain profits higher than usual if this entails taking risks, investing or making	It is confirmed that business progression depends on the profitability of organizations, and is only achieved with significant investment and effort.

	competition, as well as the methodological difficulty of determining production costs and pricing, therefore that it is necessary to implement innovative activities that allow organizations to generate profitable products:		extraordinary efforts.	
Dynamic capabilities and strategic management.	**David J. TEECE. -** The essence of multinational companies lies in their dynamic capabilities.	Classification of dynamic capabilities for: (i) the selection and implementation of routine processes; (ii) the selection and implementation of improved business "models"; (iii) the identification of investment options: the special role of complementary and co-specialized assets; (iv) asset orchestration, knowledge sharing and coordination; (v) efficient learning, technological development and protection of intellectual property.	The writer's opinion is limited to the situation of multinational companies but does not establish a position regarding other business segments.	The extensive scope that includes dynamic capabilities in supranational organizations.
Marketing	**Philip KOTLER and Gary ARMSTRONG. -** Marketing is a social process by which individuals and groups obtain what they need	The segments likely to receive the benefits of marketing are: (i) goods; (ii) services; (iii) experiences; (iv) events; (v) people; (vi) places;	The stages through which the purchase decision is made are determined, and specifically the one related to the acquisition of new	1.- The impact of marketing on (i) the **phases** that the buyer goes through in his attempt to satisfy his requirements; (ii) the role that the **political environment** plays in

	and want by creating, offering and exchanging products and services of value freely with others.	(vii) properties; (viii) organizations, (ix) information, as well as (x) ideas.	products, without extending it to other types of products or to the category of services.	marketing decision-making, and (iii) the impact of growing regulatory regulation in the field of business. 2. - Close link between the quality infrastructure system and marketing, as the latter exerts considerable influence on the consumer but commits him to supporting the entrepreneur's offer with quality arguments that justify the price in proportion to the benefits that it provides the acquirer will receive.

CONCLUSIONS

The data obtained from the searches carried out by the Global Quality Infrastructure Index allow us to affirm that export is a significant (not to say definitive or exclusive) reference in determining the degree of development of the quality infrastructure of a country. Thus, for example, this index has allowed Mexico to be classified for the year 2020 according to the GQII 2020 Global / Global Classification and Subclassification by areas of Quality Infrastructure, in global position 18; in metrology position 16; in standardization position 40, and in accreditation position 8:

This study confirms the strong correlation between the development of Quality Infrastructure and the export capacity of a country. Major exporting economies, such as the United States of America, China and Germany, are at the top of the global Quality Infrastructure rankings, as expected. Although this relationship does not suggest causality, it does clearly indicate that an increase in exports requires correlation with a more solid national Quality Infrastructure system.

To solve the problem of the absence of competitiveness in Mexico, in an attempt to harmonize with the National Development Plan 2019-2024, the Special Program for Productivity and Competitiveness has been created, as well as the Special Program for Science, Technology and Innovation. However, agreeing with authors such as Alma de los Ángeles RÍOS RUÍZ, said Plan is pretentious in terms of its scope, but leaves much to be desired regarding the definition of the objectives, strategies and actions that would materialize the social ideology contained in such document by not referring to the instruments for measuring its compliance, so it only denotes the complete absence of public policies that articulate it.

In these circumstances, we are faced with a simple discursive language with purely subjective perceptions (therefore lacking support that leads to the solution of problems defined as public), which will not contribute to the consolidation of the quality infrastructure.

In the international context, the causes that inhibit the development of a Quality Infrastructure System have been identified: (i) the asymmetry between the countries of the northern and southern hemisphere in terms of the introduction or consecration of said system (since in the south it started late), (ii) the indeterminacy of the countries of the southern hemisphere to adhere to the guidelines of the states of the northern hemisphere or benefit from the economic imports of products from China and Southeast Asia; (iii) the fact that Quality Infrastructure is a novel topic, and (iv) that despite technological advances, there is a lack of systematic guidance for the compilation and strategic use of data.

Likewise, the problem lies in the fact that the development plans and programs of a considerable portion of countries do not provide for the integration - even gradually - of a Quality Infrastructure system, and in the best of cases its introduction does not occur. It is uniform in covering technical aspects of only some of the production or service sectors.

This passivity results in: (i) the limitation of export capacity, thus conditioning its entry into international coverage markets; (ii) the absence of added value of its products and services for the purposes of modernization and generation of knowledge, and (iii) that the lack of organization of the private productive sector and its abstinence from interaction with the government is maintained indefinitely with a view to promoting self-regulation.

The Quality Infrastructure System in Mexico

Among the advantages of the Quality Infrastructure System, those indicated below stand out significantly: (i) it promotes the development of impartial processes supported by evidence of a technical, scientific nature, risk analysis and adoption of consensus decisions with the sectors participating in normalization, standardization, conformity assessment and metrology activities, which will support the inclusion of interested parties in the development of activities of the National Quality Infrastructure System; (ii) expansion of productive capacity, continuous improvement in value chains, and the promotion of international trade, and (iii) the most important is that it promotes technological innovation not only of goods and products, but also of processes and services that improve people's quality of life.

The most significant challenges that Mexico must overcome to obtain acceptable indicators in the Quality Infrastructure System Indices are: (i) the systematization of the set of information related to normalization, standardization, conformity evaluation and metrology; (ii) encourage the practice of activities inherent to scientific research, technological development and innovation in the various subjects of the National Quality Infrastructure System and thereby generate new scientific knowledge oriented to innovation in the country; (iii) actively participate in the conclusion and dissemination of equivalence agreements and mutual recognition agreements that are formalized in the international context; (iv) develop permanent public policies that support and smooth knowledge as well as the modernization of the integrating elements of the Quality Infrastructure System (normalization, standardization, accreditation, conformity evaluation and metrology), and (v) timely materialize the benefits that the aforementioned System entails, which will promote the promotion of the culture of compliance with Official Mexican Standards, International Standards and Norms.

The future of Mexico in terms of Quality Infrastructure is encouraging given the following circumstances: (i) its proximity to the United States market places it in a privileged position that it must take advantage of under the figure of nearshoring or relocation from companies to a country close to where they wish to export; (ii) the benefits generated by the implementation of the Quality Infrastructure Law will allow it to be in a position to encourage the influx of the public, social and private sectors in the preparation and compliance of both the Official Mexican Standards and the Standards; to agree on collaborative instruments in the fields of standardization, conformity assessment and metrology with the concurrence of the Standardizing Authorities, the Designated Institutes of Metrology, the National Metrology Center, the organizations dedicated to accreditation and conformity assessment, the entities at the local and municipal levels, as well as the private and social sectors; promote technological innovation with respect to the wide range of goods, products, processes and services with the aim of improving the conditions of the quality of life of the inhabitants, and in general promote the integrative activities of the system (normalization, standardization, accreditation, evaluation of conformity and metrology).

Mexico's recent low indices in the Global GQII are the product of the following factors: (i) Mexico's lack of competitiveness in the global context; (ii) Mexico's limited export capacity (which conditions its entry into international coverage markets); (iii) the absence of added value of its products and services for the purposes of modernization and knowledge generation; (iii) the lack of organization of the private productive sector, and (iv) the abstinence of interaction with the government in order to promote self-regulation. However, Mexico is able to improve its current position in the Global GQII.

FUTURE LINES OF RESEARCH

A certain attraction remains in continuing the study towards the experiences that Latin American countries have had in terms of quality infrastructure. This in order to take advantage of the benefits that it has brought mainly for the states integrated in the southern cone, not only in their interaction in the Southern Common Market, but from their internal market. In a complementary way, we would like to delve into the knowledge of the regulation of quality infrastructure in Brazil as a member of the BRICS where it participates jointly with Russia, India, China and South Africa.

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